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MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
August 1945

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, non members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or $1.25 each six months.

Our next meeting will be held September 2, at the Los Angeles Museum, Exposition Park, Los Angeles, Calif. at 2:30 P.M. All interested persons are welcome.
We are now meeting the first sunday of each month.

Please mail all news about shells, shell publications, shell collectors, shell trips, localities etc. to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.

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We still have on hand a few copies of our bound Distributional List, Part I, Pelecypoda, for which we are asking $5.00 to our fund.

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S.L. Kimball, Master, U.S. Engineer Dredge Sacramento, c/o Fleet Post Office, San Francisco, Calif. We have the following interesting letter.

" I just received the Minutes of the club for May which is the third copy I have received and I have found them all extremely interesting although I am very much of an amateur at shell collecting. I have, however, devoted much of my spare time to collecting during the past three years that I have spent out here in the islands of the Pacific, and having been on the water all of the time I have had a golden opportunity.

A very short time ago I spent several weeks at (censored) and got a fine lot of shells. What pleased me most was that I got forty three (43) species of Conus, many of which I am unable to identify. I found one specimen of Conus sulcatus which was the only one found by any of my crew and I have about a dozen ardent collectors in my crew. I also found four (4) species of Terebra and about a dozen Cypraea along with the general run of shells. I was also much pleased to find about twenty five (25) Vasum ceramicum along with several other Vasum.

I was much interested in the article in the May Minutes sent in by Mr. W.J. Eyerdam written by Robbin Coons for if I only knew the man's name referred to in the article I could probably find him within an hour or two and I am also expecting to find many rare shells here and have already found several that I could not identify.

I was also much interested in the article by Dr. B.R. Bales as I have also collected on many of the Florida Keys and I consider that one of the richest collecting grounds anywhere.

We have both shallow and deep water diving gear which is a great help in finding shells that are seldom found on the beaches.

I trust that when the war is over I may meet you and many of your collector friends and compare notes."

Hulda Magalhaes, 38 Old Main, Marine Biological Laboratory, Woods Hole, Mass. " Enclosed you will please find a check for $2.50 to cover the minimum fee for the Minutes of the Conchological Club of Southern Calif. I believe that such a fee as suggested in your May issue is only a fair means of covering expenses etc. I would be interested in continuing on your mailing list.

Please change the address from that which you have to the following address: Box 283, College Station, Durham, North Carolina.

The address at the top of the page is for the summer only. I am here at Woods Hole for a month or two to continue some work on the genus *Busycon* begun at Beaufort, N.C."

Mrs. E.P. Van Duzee, P.O. Box 285, Alameda, Calif. We are pleased to welcome Mrs. Van Duzee to our list of friends and subscribers.

Homer V. Geib, 3064 Columbia St., San Diego 1, Calif. Glad to have a good letter from our friend Geib. " ... The reports from the boys in the Pacific certainly makes pleasurable reading."

Professor T.D.A. Cockerell, 908 10th, Boulder, Colorado. " I greatly admire the enthusiastic work done by you and your colleagues of the Conchological Club, but I don't think it is worth while to send me the " Minutes" as they deal almost exclusively with marine shells which I do not study. I used to be keen about marines but now I cannot keep up with them. I sent you my paper on the Colorado Desert of California hoping that it will interest you. I suppose that Willett's *Acteocina anomala* will certainly be found living in the Gulf of Calif."

Wm. K. Emerson, 2435 Bancroft St., San Diego 2, Calif. " I would like to acquire by exchanging marine species from the coast north of Monterey, Calif. I would like to hear from anyone with such material to offer and is interested in So. Calif. species in exchange."

Miss Grace Stillwell, 337 Cedar Ave., Long Beach 2, Calif. " .... think your magazine a very fine contribution. I have 2 nephews going to the Pacific theatre. Maybe I'll get some shells somehow. "

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New Publication Received-

" The Colorado Desert of California: Its Origin and Biota" by T.D.A. Cockerell, Transactions Kansas Academy of Science, Vol.48, No.1, June, 1945. 39 pages and numerous plates and text figures.

This paper is so full of intensely interesting facts and theories about the Colorado and Mojave deserts that few of us will lay it aside before we have read the last page. One is tempted to attempt a review of the entire paper but inasmuch as our interests here should perhaps be confined to conchology there are a number of very interesting references. The chapter on Lake Cahuilla (Blake Sea), pp.13 to 16 is largely devoted to the molluscan fauna. Dr. W.O. Gregg is quoted extensively on pages 15 and 16 on the Planorbidae and the Acteocina. The land molluscan species are discussed . There is a plate of two really good figures on page 29 of *Micrarionta orocopia* Willett.

There is no question but that this paper should be added to all of the libraries in southern California.

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Professor Cockerell inclosed a printed copy of another of the series of " Letters from Douglas Cockerell, Letchworth, England, to his brother T.D.A. Cockerell." This letter dated April 1,1945 is the sort of a letter that you read twice and find yourself scanning it the third time. Brother Douglas Cockerell certainly writes interesting letters.

Family NASSARIIDAE

Genus Nassarius Dumeril,1805. Zool. Analytique, p.166,1806, genus without species; Froriep's translation, p.167,1806, only species added, Buccinum arcularia, fide Iredale, Proc. Malac. Soc. London, Vol.12, pp. 80,81,82,1916. Type (by monotypy) (Froriep Translation),1806, Buccinum arcularia Linnaeus.

" Shell rather ovate, spire produced; sculpture variable; aperture ovate; anterior canal abruptly truncated and deeply notched; a basal constriction on the exterior of the body whorl usually prominent."

Dr. Dall used the family name Alectrionidae with the genus Alectrion Montfort,1810 and type Buccinum papillosum Linnaeus. This usage has been very generally rejected. The type of the genus Alectrion is said to be very different from any of our west coast species. Discussed by Grant and Gale,1931, p.672. Arcularia Link,1807 has been used by a number of authors. However, it is an absolute synonym of Nassarius. The consensus of opinion at this time is to accept Nassarius. However, this problem is still a mooted matter. Dr. W.P. Woodring (Per. Comm. July,1945) advises " Though I have used Nassarius as a substitute for Lamarck's Nassa, that usage is of doubtful validity) See Pilsbry and Lowe, Proc. Phila. Acad. Nat. Hist. vol.84, p.68,1932). For the time being I prefer to use " Nassa" (U.S. Geol. Survey Prof. Paper 190),p.26,1938; Prof. Paper 195, pp. 86-87,1941). It may be pointed out that " Nassa" tegula represents Nassarius proper and that Schizopyga is available for " Nassa" fossata, "N" cerritensis, " N" perpinguis and allies". However, Nassarius Dumeril was presumably proposed as a substitute for Nassa Lamarck and seems to be accepted by the majority of recent authorities. Dr. A. Myra Keen (Per. Comm. July,1945) states "Until such time as some one makes a careful evaluation of this family, I suggest that for our west coast forms, Nassarius in the broad sense be used except for subgenus Schizopyga for the californiana-perpinguis-fossatus groups and Nassarius s.s. for N. tegula which is very close to the type ,N. arcularia." Re Dr. Woodring's comments: I do not feel the same reluctance about accepting Nassarius. After restudying the Dumeril in Froriep proposal I still regard it as a valid name, not an emendation of Nassa."

We will take up a more detailed discussion of the subgenera and species involved in our fauna north of San Diego following a key to some of the species of the coast and a list taken from Mr. A.M. Strong's notebook.

Adult shell with a heavy callus about the aperture
. Axial ribs rising to prominent nodes
.. Whorls with a single row of nodes on the shoulder
... Expanded callus of inner lip orange
    30 x 30 mm Gulf of Calif. to Chile .... luteostomus
    Tryon 4:39, pl.12, fig. 165; Reeve, pl.10, fig. 63.
... Expanded callus of inner lip white
.... Shell dark, sometimes with a yellowish band
    San Francisco to San Diego .... tegulus
.... Shell whitish, brown spots below the suture
    Magdalena Bay to Panama .... tiarulus
    Reeve , pl.14, fig.92.
.. Whorls with 2 rows of nodes between the sutures
    20 x 11 mm San Diego to Gulf of California ...... noduliferus
. Axial ribs granular
... Ribs obliquely granular on upper whorls
... Shell ash colored with a yellowish band
    12.5 x 7.5 Panama to Peru .... complanatus
    Tryon, vol.4, p.33; Reeve, pl.17, fig. 111.

.... Expanded callus brown
16 x 9 mm. Gulf of California .... moestus
Nautilus, vol.7, p.19.
... Shell yellowish brown Gulf of Calif. to Peru ... major
Proc. USNM, vol.17, p. 181.
... Shell pale violet with darker bands
Gulf of California .... iodes
Proc. USNM, vol.51, p. 577
.. Ribs flexuous, granulated at the suture
18 x 9 mm. Panama to Peru .... exilis
Tryon Man. Conch., vol.4, p.32; Reeve, pl., fig.101.
. Axial ribs not nodulous or granular
.. Spiral sculpture of fine striae
13.5 x 7.5 mm. Gulf of California .... crebristriatus
.. Spiral sculpture of strong threads
14 x 7 mm. Central America to Panama .... scabriosculus
Tryon, vol.4, p.46; Reeve, pl.26, fig. 174.
Callus thin or absent in the adult
. Axial ribs faint or present on early whorls only
.. Spiral sculpture of granular ridges
30 x 20 mm. Vancouver to Cerros Island ---------- fossatus
.. Ridges smooth, strong toward the base
20 x 9 mm. Peru .... planicostatus
Tryon 4-34, pl.10, fig.102; Reeve, pl. fig.76.
.. Spiral sculpture of fine grooves
2- x 12 mm Point Arena to Cerros Island ...... insculptus
Callus thin or absent in the adult
. Axial ribs and spiral cords forming an evenly reticulated sculpture
.. Spirals between sutures four
... Sutures channeled
6 x 5 mm. Cerros Island to Panama .... onchodes
Proc. USNM, vol.51, p.577
... Sutures not channeled
20 x 11.5 mm. Panama .... miser
Bull. Mus. Comp. Zool., vol. 43, p.307
.. Spirals between sutures five
Acapulco to Magellan Straits .... taeniolatus
Tryon, vol.4, p.57, pl.18, fig.273.
.. Spirals between sutures six
... Axial ribs about 16
9 x 4.5 mm. Galapagos .... exsarcus
Bull. Mus. Comp. Zool., vol. 43, p.308.
... Axial ribs about 20
.... Axial ribs oblique
23 x 12 mm. Puget Sound to Cerros Island .... perpinguis
.... Axial ribs not oblique
14 x 8.5 mm. San Miguel Island to Panama .... catallus
Bull. Mus. Comp. Zool. vol.43, p.307.
... Axial ribs about 25
31 x 14 mm. Oregon to San Ignacio Lagoon .... californianus
. Axial ribs predominating in strength
.. Whorls strongly angulated
... Two sharp, narrow sulci between sutures
5.3 x 3 mm. Gulf of California .... limacinus
Proc. USNM, vol. 51, p. 577.
... Four low, flat, spiral ridges between sutures
5.5 x 4 mm. Galapagos .... goniopleurus
Bull. Mus. Comp. Zool. vol.43, p.308.

List of species of *Nummarius*

Nummarius fossatus Gould,1849. Vancouver to Cerros Island
Nummarius insculptus Carpenter,1864. Point Arena to Cerros Island.
Nassarius perpinguis Hinds,1844. Puget Sound to Cerros Island.
Nassarius californianus Conrad,1856. Oregon to San Ignacio Lagoon
Nassarius cooperi Forbes,1850. Puget Sound to San Diego.
Nassarius mendicus Gould,1849. Alaska to Magdalena Bay.
Nassarius cerritensis Arnold,1903. Long Beach to Gulf of California
Nassarius nodicinctus (A. Adams),1851. San Diego to Panama.
Nassarius catallus Dall,1908. San Miguel Island to Panama
Nassarius onchodes Dall,1917. Cerros Island to Panama.
Nassarius dentiferus (Powys),1835. Cerros Island to Peru
Nassarius teschudii (Troschel),1852. Cerros Island to Peru.
Nassarius versicolor (C.B. Adams),1852. Magdalena Bay to Peru.
Nassarius pagodus (Reeve),1844. Gulf of California to Panama.
Nassarius moestus ('Hinds),1844. Gulf of California to Chile.
Nassarius corpulentus (C.B. Adams),1852. Gulf of California to Panama.
Nassarius limacinus (Dall),1907. Gulf of California.
Nassarius angulicostis Pilsbry & Lowe,1932. Gulf of Calif. to Panama.
Nassarius guaymasensis Pilsbry & Lowe,1932. Guaymas.
Nassarius taeniolatus (Philippi),1845. Acapulco to Chile
Nassarius gemmulosus (C.B. Adams),1852. Acapulco to Panama.
Nassarius nucleolus (Philippi),1845. Acapulco to Panama.
Nassarius mystiricatus (Hinds),1844. Acapulco tp Panama.
Nassarius miser(Dall)1908. Acapulco to Panama.
Nassarius gallegosi Strong & Hertlein Gulf of Calif. to Central America.
Nassarius polistes Dall,1917. Panama and Galapagos.
Nassarius stimpsonianus (C.B. Adams),1852. Panama.
Nassarius nodiferus (Powys),1835. Panama and Galapagos
Nassarius exsarcus Dall,1908. Galapagos.
Nassarius goniopleurus (Dall),1908. Galapagos
Nassarius townsendi (Dall),1908.
Nassarius planicostatus (A. Adams),1851. Peru.
Nassarius gayii (Kiener),1835. Peru and Chile
Nassarius escaleus (Philippi),1860. Chile.
Nassarius tegulus (Reeve),1853. San Francisco to San Diego.
Nassarius noduliferus (Philippi),1848. San Diego to Gulf of California.
Nassarius tiarulus (Kiener),1834. Magdalena Bay to Panama.
Nassarius luteostomus (Broderip & Sowerby),1829. Gulf. of Calif. to Chile.
Nassarius crebristriatus (Carpenter),1857. Gulf of California.
Nassarius major (Stearns),1894. Gulf of Calif. to Panama.
Nassarius iodes (Dall),1917. Gulf of California.
Nassarius scabriusculus (Powys),1855. Central America to Panama.
Nassarius complanatus (Powys),1835. Panama to Peru. Corinto.
Nassarius exilis (Powys),1835. Panama to Peru.
Nassarius festivus (Powys),1835. Panama to Ecuador.
Nassarius paposanus (Philippi),1860. Chile.
Nassarius spartus (Marrat),1897. Chile.
Nassarius braneostomus (Stearns) San Felipe.

Genus Nummarius Dumeril,1805.

The difficulties involved in an attempt to allocate the west coast species to subgenera are so close that we propose here to consider them all Nassarius with the exception of the Schizopyga Conrad group.

Nassarius tegulus (Reeve),1853. San Francisco, Calif. to San Ignacio Lggoon, Lower Calif. (Jordan). Type locality not given.

Description of this very common species is unnecessary. However, Grant and Gale state that the southern specimens have heavier axial sculpture and tend to probably grade into N. luteostoma (Broderip & Sowerby). Our experience has been to find specimens of this species taken from the Estero de Punta Banda below Ensenada, Mexico somewhat more slender than typical sputhern California shells. The Estero race is clearly the species though and in our opinion not worth giving a varietal name. Our experience has been to find this a bay form and very common in such localities as Newport Bay, Anaheim etc. However, we have never picked it up in our dredged in the open sea at any depth. (Burch).

Collecting data: From Alamitos Bay, Calif. to Scammons Lagoon, L.C. and Santo Domingo, L.C. (Lowe); Orcutt reported the species from Guaymas ?

Nassarius nodicinctus (A. Adams),1851. Galapagos Islands.

Dr. Dall listed this species from " San Diego to Panama and the Galapagos Islands". However, we propose to drop it from our faunal list. The consensus of opinion is well stated by Mr. A.M. Strong as follows: " This is a well marked species in the Galapagan fauna. There are no recent records from any other locality, though Carpenter lists it from the Gulf of Calif, probably an error, and nothing like it is known from San Diego."

The H.N. Lowe collection in the San Diego Museum contains numerous specimens from the type locality, Galapagos but none from elsewhere. Sets are from Seymour Bay, Indefatigable Island, Galapagos; Albemarle Island, Galapagos.

Nassarius noduliferus (Philippi),1848. Listed by Dr. Dall from " San Diego to Gulf of. California ". However, this is another species that we propose to drop from our faunal list. Mr. A.M. Strong states the problem or perhaps but one of them as follows: " Nassarius nodifera Powys- C.B. Adams and Carpenter recognize this as a west coast shell, Panama and Galapagos. The name seems to have been mixed with N. noduliferus Philippi which seems definitely to have come from the China seas, though Carpenter used it for a variety of N. tegulus and states non nodifera Powys. Tomlin has something to say about this in Proc. Mal. Soc. vol.20, p.43. It is doubtful is either name can be applied to a west coast shell and certainly not from San Diego."

The only collecting records we have are two from Mazatlan,Mexico (Lowe and also A. Forrer).

Nassarius insculptus (Carpenter),1864. Point Arena, California to Cerros Island, Lower Calif. Type locality, Catalina Island, Calif. in 30-40 fms. " ... characterized by fine spiral sculpture and by the absence of axial sculpture except on the small, upper whorls of the spire. The inner lip has a definitely delimited parietal callus. The form eupleura is an individual variation of no taxonomic value." (Grant and Gale, p.677). The consensus of opinion is to follow Grant and Gale and abandon N. insculptus eupleura Dall,1916 to the synonymy of the typical.

Collecting data: Our experience has been to find this a rather common form in relatively deep water. Our records show off Redondo Beach 25 to 75 fathoms, off El Segundo in 50 fms., off Santa Cruz Island in 50 fms., off Avalon, Catalina Island in 35 fms. (Burch); down to at least 200 fms. off Catalina (G. Willett); San Pedro, Calif. in 20 fms. (G. Willett); Newport Bay (Lowe); Catalina Island in 30 fms. (Lowe); off south end of San Clemente Island in 50 fms. (Dr. Fred Baker); Magdalena Bay, L.C. (Porter).

Subgenus Schizopyga Conrad,1856. Type (by monotypy), Schizopyga californiana Conrad.

" Shell rather thin, bucciniform, with a conspicuous constriction on the base of the body whorl; sculpture cancellate or with spiral threads and broad axial folds; outer lip simple, lirate within, the posterior notch not developed; parietal wall concave, with or without a callus wash."

The status of Schizopyga is obviously affected by that of the genotype. This is very uncertain.

Nassarius californianus (Conrad),1856. Squaw Creek, Oregon (A.M. Keen) to Magdalena Bay, Lower Calif. (Eric Jordan). Type locality, Santa Clara, Calif (Santa Clara County); presumed to be Miocene (Grant & Gale). Dr. W.P. Woodring (Per. Comm. July,1945) comments on the species as follows: " Nassa" californiana. The type based on fossil material, presumably Pliocene, from a locality near Santa Clara, is lost and the status of this species is uncertain. It is probably the species described later as " Nassa" moraniana. " Nassa" moraniana is an extinct Pliocene species not known to occur in the Pleistocene, though "N" grammata, alleged to be from Santa Barbara, presumably Pleistocene, is a synonym. The Recent species, identified by Dall as californiana is not moraniana and evidently is not californiana. It presumably needs a new name." Dr. A.M. Keen comments upon the above " His point about californiana is well taken which leaves Schizopyga rather more shaky than one would wish." Perhaps Dr. Woodring will give us a new name for it. Before leaving the subject though the following is of some interest. Grant and Gale ,1931, p.676 under Nassarius moranianus (Martin) 1914 state that it is known in Recent collections as gouldii. Dr. A. Myra Keen advises regarding the name gouldii as follows: " The name Nassa gouldii is, so far as I am aware, a nomen nudum. In about 1917 Stanley Herold and Mrs. Oldroyd revised the fossil and Recent nassarids in the Stanford West Coast Collection and planned a paper in which a number of new species were to be described, one of which was N. gouldii. The paper was never published. All of their specimens labelled " N. gouldii" are fossils, so that I am at a loss to explain the statement by Grant and Gale." Mr. George Willett comments " Don't know what this means. I have found moranianus only in Pliocene."

Collecting data: Newport Bay, Calif. (Chace); living specimens from Drakes Bay, Calif. and Monterey Bay, Calif. in 15 fms. (H.N. Lowe); Lower Calif., no locality given, by Geo. D. Porter who collected for Miss J.M. Cook. this was one of the characteristic species of the Del Rey Pleistocene deposit in the Baldwin Hills, Calif. (Burch).

Nassarius fossatus (Gould),1849. Vancouver Island, British Columbia to San Ignacio Lagoon, Lower Calif. (Eric Jordan). Type locality, " Puget Sound and mouth of Columbia River" (Gould).

Collecting data: This is our common large species of this genus. An interesting feature of their habit is that one of the bestways to collect a number of them is to stake out a dead fish or piece of decaying meat in the water and in a short time these will start to move toward the bait. Their sense of smell, or whatever it is, is interesting because they may be observed heading toward this bait as far away as 50 ft. or more. Our experience has been to find them very abundant in Morro Bay 6/36, Anaheim Bay 1/19/36, Newport Bay 6/36, Seaside,Oregon 2/41, Terminal Island,San Pedro and the

Estero below Ensenada,Mex. They are apparently not seasonal but we recorded them as spawning in Anaheim Bay in January. The bathymetric range is not deep but we have taken them as deep as 20 fathoms off Redondo Beach (Burch). Cape Perpetua,Oregon to San Diego, Calif. (San Diego Museum);

Nassarius mendicus (Gould),1849. Kodiak Island, Alaska to Magdalena Bay, Lower California. Type locality; Dr. A.M. Keen advises that " The holotype label of N. mendicus at the National Museum gives the type locality as Straits of Fuca".

" N. mendicus (Gould) has a narrow spire, with fine spiral sculpture and axial plications. It grades into variety cooperi, a variety with few, broad undulous axial ribs. N. mendicus differs from perpinguis in its fewer more continuous axial ribs." (Grant and Gale, p.674).

The variety indisputabilis I.S. Oldroyd,1927, was figured by Mrs. Oldroyd but not described. It is generally ignored as of no value.

Collecting data: Our experience has been to find the typical of this species the predominant form in the northern part of the range with cooperi more common in the south. The specimens in our collection from Port Orchard, Washington show less indication of the axial ribbing than any of the others in our collection. Not uncommon in dredgings off Monterey in 10,25 and 40 fathoms, but more common under 25 fms. but the predominant Monterey form seems to be cooperi. Fairly typical specimens taken littoral in Morro Bay. (Burch); Kodiak Island; Prince William Sound (Lewis) (G. Willett); Bear Bay, Peril Straits,Alaska (Kate Stephens) and on down the coast to San Diego (San Diego Museum).

Nassarius mendicus cooperi (Forbes),1850. Puget Sound to San Doego,Calif. (Dall). Type locality, Sandwich Islands, possibly a ballast shell (fide Grant and Gale).

This variety is characterized by fewer and larger axial ribs than typical mendicus, but all stages of intergrades may be selected. If it were not for that fact that one seems to be northern and the other southern in the center of their respective ranges it would be suggested that this variety be placed in the synonymy of the typical.

Collecting data: This common species may be taken in every lagoon as well as all along the open coast. It is one of the most common shells in the dredgings down below 25 fathoms off Redondo Beach, Calif. as well as Monterey, Dana Point,on down to Todos Santos Bay, Mexico. Just note that the last seems to be an extension of range from the above for cooperi. (Burch, Cayucos, Calif. (Wilcox); Newport Bay (Lowe); Mission Bay (Bristol); San Diego (Hemphill); off South Coronado Island in 10 fms. (Dr. Fred Baker).

Dr. W.P. Woodring calls attention to an interesting fact about the specie Nassa intastriata Conrad,1855 " Nassa" interstriata (or intastriata) Conrad, 1855. Based on fossil material from San Pedro. The type is lost. Carpenter thought it is "N" mendica." Grantand Gale, however, place this species in the synonymy of perpinguis.

Nassarius cerritensis (Arnold),1903. Long Beach, Calif. to Magdalena Bay, L.C. (Dall). Dr. A. Myra Keen advises " Specimens of Nassarius cerritensis in the Stanford collection collected by H. Hemphill at Point Abreojos, L.C. were identified as such by Dr. Dall. Type locality, Los Cerritos (Signal Hill Los Angeles County, Pleistocene.

This is another very questionable member of our Recent fauna. It is a common fossil in local Pleistocene deposits but seems to be of the southern fauna. The consensus of opinion regarding this species is stated by Mr . George Willett briefly " Probably Lower Californian".

Collecting data: N. cerritensis (Arnold) - Characterized by being more elongate than fossatus with fewer axial ribs. It is not uncommon in the Del Rey deposit of the Baldwin Hills Pleistocene. (Burch); living specimens from Santa Maria Bay, Lower Calif. (Lowe); 2 specimens living from San Ignacio Lagoon, L.C. (Lowe).

Dr. W.P. Woodring advises (Per. Comm. July,1945) " Nassa" cerritensis A small race or a closely related species is living along the Lower California coast at Point Abreojos and Ballenas Bay and in the Gulf of Calif. at Guaymas."

Nassarius perpinguis (Hinds), 1844. Puget Sound to Magdalena Bay, Lower Calif. (Grant and Gale.) Type locality, Magdalena Bay, Lower California.

This very common ventricose species needs no discussion. N. perpinguis bifasciata Berry, Nautilus, vol.22, p.39,1908 is a color variety and generally ignored as of no consequence.

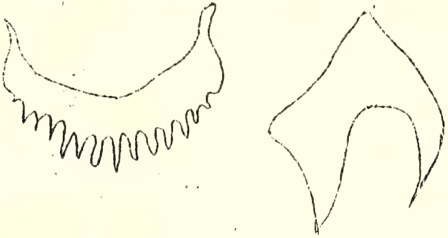
Collecting data: Very abundant in all sloughs as well as along the open coast. A list of collecting localities would be a waste of paper listing every point on the coast. It might be mentioned that the bathymetric range is of some interest. We have brought it up living from close to 50 fathoms off Redondo Beach and as deep as 40 fathoms off Monterey, 35 fms. off El Segundo (Burch)

Subgenus Ilyanassa Stimpson,1865. Type (by original designation) N. obsoleta Say/

Nassarius obsoletus (Say),1822. San Francisco Bay (introduced).

Collecting data: Very abundant on the mud flats along the Bay Shore Highway just north of San Mateo, Calif. in May,1939 (Burch).

Below is a drawing of the radula of Nassarius fossatus (Gould)- Rachiglossa.



The following genera are not represented in our fauna north of San Diego but a list of the species in the southern fauna discussed in Mr. A.M. Strongs notebook may be of interest.

Genus Phos Montfort,1810.

Phos articulatus Hinds,1844. Central America.
Phos gaudens Hinds,1843 Montijo Bay (Lowe) Acapulco,Mex. Punta Penasco(Lowe
Phos veraguensis Hinds,1843. Acapulco, West Mexico.
Phos crassus Hinds,1843
Phos cocosensis Dall,1896.
Phos minusculus Dall,1917.

(con.)

Phos chelonia Dall,1917.
Phos fusoides C.B. Adams,1852.
Phos clarki Smith,1944. Panama Bay.

Genus Nassarina Dall,1889 in Collumbellidae.
Nassarina solida Dall,1917. La Paz
Nassarina atella Pilsbry & Lowe,1932. Acapulco.
Nassarina xeno Pilsbry & Lowe,1932 Nicaragua
Nassarina poecila Pilsbry & Lowe,1932. Nicaragua
Nassarina pammiora Pilsbry & Lowe,1932. Nicaragua

Genus Hindsia Adams,1853.
Hindsia perideris Dall,1910. La Paz.
Hindsia acapulcana Pilsbry & Lowe,1932. Acapulco. nr. Manzanillo,Mex.
Hindsia ariel Pilsbry & Lowe,1932. Nicaragua

Genus Northia Gray,1847.
Northia northiae (Gray),1833. Gulf of California to Ecuador.

Genus Buccinanops
Buccinanops squalides King,1831. Peru.

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Family COLUMBELLIDAE

Some of our members have been disposed to follow Grant and Gale in the use of the family name Pyrenidae. This usage was based largely upon their assumption that all family names should be based upon the oldest genus in the group. In regard to this name Dr. A. Myra Keen advises (Per. Comm.) " I believe that Pyrene and Columbella are at least subgenerically separable. Hence, the family name Columbellidae is available by priority. ". Mr. A.M. Strong also states " From the types Pyrene seems to be quite distinct from Columbella of the north Atlantic. I think we should use the family name Columbellidae, but not the genus Columbella."

Key to Genera of the family Columbellidae- Mr. A.M. Strong.

Shell coniform,aperture long and narrow .... Paramentaria
Shell strombiform to ovate
. With both posterior and anterior canal
.. Shell with both axial and spiral sculpture........ Microcitharia
.. Sculptured with spiral striae on the canal only .... Bifurcium
. With anterior canal only
.. With spiral sculpture only
... Spire short, shell thick and heavy .... Pyrene
... Spire as long or longer than aperture,shell smaller .. Mitrella
.. With axial and spiral sculpture
... Shell 8 mm. or more in length .... Anachis
... Shell less than 8 mm. in length .... Seminella
Shell subcylindric, columella and canal short .... Aesopus
Shell tapering, body whorl swollen .... Strombina
Shell bucciniform, lip sharp or only slightly thickened
. With reticulated sculpture .... Amphissa
. With fine spiral sculpture only .... Cosmioconcha

Genus Paramentaria Dall,1916. No species reported north of San Diego.
Paramentaria dupontii (Kiener) Gulf of California Tryon,v.5,pl.60
Paramentaria coniformis (Sowerby) Gulf of Calif.
Paramontaria concinnata (Crosse),1858. Central America

Genus Microcitharia Fischer,1884.
Shell yellowish white, with irregular chestnut marks
15 mm Panama........................ harpaeformis
Shell fulvous olive, freckled with pale dots
11 mm. Acapulco to Central America................. uncinata
Tryon, vol.5, p.196
Microcitharia harpaeformis (Sowerby),1832. Panama
Microcitharia uncinata (Sowerby),1832. Acapulco to Central America

Genus Bifurcium Fischer,1884.
Shell pale livid, with longitudinal lines Panama and Galapagos-Bifurcium
Tryon vol.5, p. 183.
Bifurcium bifurcium Fischer Panama
Montijo Bay (Lowe)

Genus Pyrene Roding,1798. No species reported north of San Diego.
Type (by monotypy), Pyrene rhombiferum Roding,1798 -- Buccinum punctatum Bruguiere - Voluta discors Gmelin.
The following key to species of Pyreneis from Mr. A.M. Strong's notebook

Whorls channeled between the shoulder and suture
. Shell chocolate brown with fine white dots
28 mm Panama to Peru .... paytensis
Tryon, vol.5, p.104
. Shell chestnut brown with white spots, orange within
21 mm Central America to Galapagos .... castanea
Tryon, vol.5, p. 105
Body whorl swollen at the shoulder, not channeled
. Shell chestnut with large white blotches
35 mm. Gulf of California to Peru .... strombiformis
Tryon, vol.5, p.104
. Shell brownish with small white spots
32 x 21 mm. Gulf of California to Peru .... major
Tryon, vol.5, pl.42, fig.6-10
. Shell chestnut with broad white markings, orange within
25 mm. Gulf of California to Panama .... haemastoma
Tryon, vol.5, p.106
Body whorl regularly rounded
. Brown with irregular white markings
22 mm. Cape San Lucas to Galapagos .... fuscata
Tryon, vol.5, p.105
. Ash colored with narrow chestnut spiral lines
25 mm. West Columbia .... labiosa
Tryon, vol.5, p. 106
. Longitudinally streaked with white and chestnut
9 mm. Cape San Lucas to Panama .... lucasana (festiva)
Tryon, vol.5, p. 106

Pyrene strombiformis (Lamarck),1822. Gulf of California to Peru
Pyrene major (Sowerby),1832. Gulf of California to Peru
Pyrene haemastoma (Sowerby),1832. Gulf of Calif. to Panama
(con.)

Pyrene fuscata (Sowerby), 1832. Gulf of Calif. to Panama
Angeles Bay, Gulf of Calif. Santa Elena, Ecuador. Hood id., Galapagos.
Pyrene lucasana (Dall) Cape San Lucas to Panama
San Juan del Sur (Lowe)
Pyrene castanea (Sowerby), 1832. Central America to Galapagos
Pyrene labiosa (Sowerby), 1832 Central America to Ecuador
Pyrene paytensis (Lesson), 1832. Panama to Chile

Genus Mitrella Risso, 1826. Type (by subsequent designation, Cox, 1927), M. flaminea Risso - Murex scriptus Linnaeus.

Grant and Gale, 1931, p.p. 689-692 give an excellent discussion of this genus and the species involved.

" Shell of medium weight, rather high spired, acutely conical; whorls almost flat to moderately ventricose, sutures linear slightly impressed; spiral sculpture confined to basal portion of body whorl (typically) or uniform over entire shell; aperture small, elongate ovate, one-half or less the length of the shell; outer lip sometimes thickened and denticulate or lirate within; inner lip with or without lirations or denticulations on columella, which is short or obliquely truncated; anterior canal hardly or not at all differentiated from the basal portion of the aperture; posterior canal undeveloped or represented by a slight flare or shallow channel on the outer lip at junction with body whorl. Size generally small."

The following key and list of species is from Mr. A.M. Strong's note-book. We will then take up a detailed discussion of the species reported from San Diego northward.

Genus Mitrella

Spiral sculpture extending over the last three whorls
9.4 x 3.4 mm. Gulf of California .... granti
Proc. San Diego Soc. Nat. Hist. vol.8, p.20.
Spiral sculpture confined to the base and canal
. Body whorl with a sharp carina at the shoulder
10 x 5 mm. San Francisco to Cape San Lucas .... carinata
Oldroyd, vol.2, part 1, p. 272
. Body whorl without carina
.. Shell stout, the spire about equalling the aperture in length
... Variously marked with varying shades of brown
10 x 5 mm Forrester Island to Mexico .... californiana
... Pale brown, irregularly spotted with yellowish white
8 x 3.75 mm. Alaska to San Diego .... gouldii
Oldroyd, vol.2, part 1, p.277
... Bluish white, epidermis yellowish
14 x 7 mm. Alaska to San Diego .... permodesta
Oldroyd, vol.2, part 1, p.275
... Pale, sometimes with pale brown variations
7 x 3.5 mm. Fuca Straits to Coronado Islands ..... luculenta
Oldroyd, vol.2, part 1, p.277
... White, more or less clouded with chestnut
8 mm. Cape San Lucas to Gyacomyo .... santabarbarensis
Tryon, vol.5, page 118
... Minutely punctate with orange spots arranged in quincunx
7.5 mm. Cape San Lucas to Panama .... millepunctata
Tryon, vol. 5, p.198
... Brownish with chestnut dots arranged in protractive rows
5.5. x 2.3 mm. Gulf of California .... lalage
Proc. Phila. Ac. Sci. vol.84, p.70

... Livid, with divaricating orange brown lines
6.25 mm. Cape San Lucas .... densilineata
Tryon, vol. 5, page 115
... White, with 1 to 3 bands of chestnut tessellations
6 mm. Gulf of Calif. to Panama .... baccata (cervanella)
Tryon, vol. 5, p. 114
... Uniformly chestnut brown
Gulf of California .... dorma B. H. & S.
... White, with a central band of brown blotches
3.4 x 1.8 mm. Acapulco to Panama .... hartfordi S. & H.
... Yellowish, with white dots on the spire
7 mm. Panama .... elegans
Tryon, vol.5, p. 115
... Transparent white with a spiral row of milk white dots
7 mm. Galapagos .... rorida
Tryon, vol.5, p.147
... Reddish fulvous, white next the suture
13 mm. Guayquil .... electroides
Tryon, vol. 5, p. 117
... Chocolate with a lighter band on the periphery
12 mm. Chile and Peru .... unifasciata
Tryon, vol.5, p.116
... Uniformly chocolate or chestnut
12 mm. Peru and Chile .... unicolor
Tryon, vol. 5, pl.47, fig. 41.
.. Shell slender, conic, spire longer than the aperture
... Periphery of the body whorl angulated
.... Shell pale, unicolor
8 x 3.5 mm. Alaska to Gulf of Calif. .... tuberosa
Oldroyd, vol.2, part 1, p.271
.... Shell yellowish
9 x 4 mm. San Diego .... casciana
Oldroyd, vol.2, part 1, p. 274
... Periphery of the body whorl rounded
.... Adult shell more than 15 mm. in length
..... Waxen white with reddish paintings
18 x 6 mm. Cape San Lucas .... xenia
Proc. USNM, vol. 56, p. 330
..... Yellowish white with narrow chestnut lines
24.5 x 10 mm. Gulf of Calif. .... nasuta
Tryon, vol.5, p. 136
..... White, variegated with brown flashes
19 mm. ? Gulf of Calif. .... acicula
Tryon, vol.5, p. 119
.... Adult shell less than 10 mm. in length
..... Light rufus or yellowish, with faint markings
7.5 mm. Puget Sound to Mexico .... hypodra
Oldroyd, vol. 2, part 1, p. 275
..... Yellowish with brown markings
5 x 2.5 mm. San Diego to Magdalena Bay .... callimorpha
Oldroyd, vol.2, part 1, p. 274
..... Orange yellow, with zig-zag lines
4.5 x 1.2 mm. Monterey to Magdalena Bay .... aurantica
Oldroyd, vol.2, part 1, p. 276
..... Yellowish horn with zig-zag brown lines
3.2 x 1.5 mm. San Clemente and Catalina Islands ... clementensis
Proc. USNM, vol. 70, p.2

.. Shell oblong-pyramidal, apex truncate in the adult
... Reticulated with chestnut or chocolate and white
17.5 x 6 mm. Gulf of Calif. to Peru .... ocellata
Tryon, vol.5, p. 122
... Shell paler, more slender, with flatter whorls
Gulf of Calif. to Panama .... delicata
Reeve, pl. 27, fig. 171.

Genus Mitrella Risso,1826.

Mitrella carinata(Hinds)1844.	Forrester Island to Salina Cruz
var. californiana (Gaskoin),1852	
var. gausapata (Gould),1850.	
Mitrella gouldii (Carpenter),1857.	Alaska to San Diego
Mitrella permodesta (Dall),1890.	Alaska to San Diego
Mitrella tuberosa (Carpenter),1865.	Puget Sound to Mexico
Mitrella hypodra (Dall), 1916.	Puget Sound to Mexico
Mitrella lutulenta (Dall),1919.	Fuca Straits to Coronado Islands
Mitrella aurantiaca (Dall),1871.	Monterey to Magdalena Bay.
Mitrella clementensis (Bartsch),1027.	Catalina Island & San Clemente Id.
Mitrella casciana (Dall),1919.	San Diego.
Mitrella callimorpha (Dall),1919.	San Diego to Magdalena Bay.
Mitrella ocellata (Gmelin),1791.	Gulf of Calif. to Peru. Atlantic.
var. baileyi Bartsch & Rehder,1939	Galapagos
Mitrella delicata (Reeve),1858.	Gulf of Calif. to Panama.
Mitrella santabarbarensis (Carpenter),1856.	Gulf of Calif. to Central Amer.
Mitrella millepunctata (Carpenter),1864.	Gulf of Calif. to Panama
Mitrella baccata (Gaskoin)	Gulf of Calif. to Panama.
Mitrella densilineata (Carpenter),1864.	Cape San Lucas
Mitrella nasuta (Menke),1850;	Gulf of California
Mitrella xenia (Dall),1919.	Cape San Lucas
Mitrella acicula (Reeve),1858.	Gulf of California
Mitrella lalage Pilsbry & Lowe,1932.	Gulf of California
Mitrella granti Lowe, 1935.	Gulf of California.
Mitrella dorma B. H. & S.	Gulf of California
Mitrella hartfordi Strong and Hertlein,1937.	Mexico to Panama.
Mitrella unicolor (Sowerby),1832.	Panama to Peru.
Mitrella elegans (Dall)	Panama
Mitrella pulchrior (C.B. Adams), 1852.	Panama
Mitrella rorida (Reeve),1858.	Galapagos
Mitrella electroides (Reeve),1858.	Galapagos
Mitrella unifasciata (Sowerby),1832.	Chile

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Mitrella carinata (Hinds),1844. Forrester Island, Alaska to Salina Cruz
Type locality, Bodegas and San Diego.

The varities hindsii Reeve,1858 and californiana Gaskoin, and gausapata Gould,1850 are all but forms of carinata and intergrade so clearly that it is the consensus of opinion that they are but one species. This is indicated by Grand Gale. The only distinctions between these is the amount of devel--opment of the keel. Of course, it is possible to select from a large series a nice set of any of them particularly gausapata. However, it seems expedient to retain gausapata as a subspecies of carinata because of the possibility that it is a good geographic race. Mr. George Willett states about this " None of my specimens from Prince of Wales Island, Alaska (shore) show any indication of a keel. Unless carinated specimens are found from the north, it may be advisable to recognize gausapata as the northern race which inter--grades with carinata as it comes down the coast, much as Nassarius mendicus and N. cooperi."

Collecting data: Our experience has been to find this small species exceedingly abundant all the way from Monterey, Calif. to Todos Santos Bay, Mex. It is usually associated with algae and rocky shores although not uncommon in bays on eel grass etc. One of the favorite habitats is the large floating kelp, Macrocysta. It is common in the dredgings off Monterey down to 10 fathoms or more, Redondo Beach down to perhaps 25 fathoms, Catalina Island as deep as 35 fathoms, Ensenada, Mexico in 15 fathoms. However, I have never been certain whether these deeper specimens really lived in such bottom algae as the fine lacy Acrosorium or were simply washed off of the heavier floating algae. It is abundant among the rocks in littoral collecting but I think always where there is kelp off shore. (Burch);

Mitrella carinata gausapata (Gould),1850. Discussed above. Same range as the typical. Type locality, Puget Sound.

Mitrella callimorpha (Dall),1919. San Diego, Calif. to Magdalena Bay,Mex. Type locality, San Diego, Calif.

We list this species but there is great doubt if it is really distinct. No member of the club uses this name to label a specimen. Following the description which is reproduced in Oldroyd, Dr. Dall makes the following comment " This belongs to the group of A. californiana, from which it differs by its much smaller size, relatively more slender form, and less pronounced coloration." Having placed californiana in the synonymy of carinata it is difficult to immagine this shell being greatly different. However, no one seems to have compared the type and we will list it until we know more about it.

Mitrella casciana (Dall),1919. U.S. Fish Commission station 4322, off La Jolla, San Diego County, Calif., in 110 to 199 fathoms, shelly mud. (Dall).

So far as we know this species has never been reported other than the original type lot. It has never been figured, and one perhaps significant statement by Dr. Dall following the description is " All those obtained at this station were " dead" shells".

Subgenus Astyris H. & A. Adams, 1853. Grant and Gale, 1931, p. 691 discuss this matter at length and figure the genotype " Mitrella rosacea (Gould). Dr. Dall used this as a subgenus of Columbella, but it has been rather extensively used with generic standing. Dr. Bartsch in 1927 described Astyris clementensis. However, Grant and Gale make an excellent case for their statement "..... and the differences do not appear to warrant generic or subgeneric separation." We are disposed to agree with this and attempt no subgeneric divisions.

Mitrella clementensis (Bartsch),1927. Proc. U.S.N.M. vol.70,Art.11, p.2, 1927. San Clemente and Catalina Island. Type locality, " on rocks at San Clemente Island."

Mr. A.M. Strong states " I have two specimens collected on the rocks near Avalon, Catalina Island. It seems to be quite distinct." Dr. Bartsch following the description comments " This species is nearest related to Astyris aurantiaca Dall, but is uniformly smaller."

Inasmuch as the original description of this species is not in Oldroyd we reprint it for convenience of members.

" Shell very small,elongate-ovate. Nuclear whorls flesh colored. Post-nuclear turns yellowish horn colored with various zigzag markings and fulgurations of brown. Nuclear whorls smooth. Postnuclear whorls appressed at the summit,marked by very fine lines of growth which are almost vertical, and numerous, closely spaced, microscopic spiral striations. Suture very slightly constricted. Periphery of the last whorl well rounded . Base long, moderately rounded ; columella marked by eight feebly developed spiral cords. Aperture large; posterior angle acute,decidedly channeled anteriorly; outer lip thin showing the external markings within; inner lip sinuous; parietal wall covered with a thin callus".

Mitrella aurantiaca (Dall),1871. Monterey, Calif. to San Martin Island, L.C. (Baker). Type locality, Monterey, Calif.

Collecting data: This seems to be a good species. Our experience has been to take it littoral at Monterey in the rocky rubble and pick it up in the dredgings on the shale off Del Monte down to perhaps 20 fathoms. We have found it comparatively rare in southern California but have found a few occasional specimens at Dana Point, Orange County. (Burch); Monterey (Lowe); Catalina Island (Hemphill); No. Island, Los Coronados (Frank Stephens);

Mitrella tuberosa (Carpenter),1865. Forrester Island, Alaska to Gulf of California. Type locality, Santa Barbara, Calif.

Collecting data: Our experience has been to find this species in somewhat deeper water than the more common carinata. Dredged off Monterey in 10 fathoms, Redondo Beach in 25 fathoms, Avalon, Catalina Island in 25 fms., El Segundo in 35 fms., Santa Monica in 10 fms., and in Todos Santos Bay, Mexico in 20 fathoms (Burch); San Martin Island, L.C. in 30 fms. (Fred Baker); San Diego (Hemphill); San Diego (Baker); So. Id., Los Coronados in 7-10 fms. (Fred Baker); Catalina Island in 20 fms. (Lowe).

Mitrella rosacea (Gould),1849. Icy Cape, Arctic Ocean, south to Peril Straits, Alaska. Circumboreal. Johnson gives the Atlantic range" Labrador to New Jersey, 3 to 60 fathoms". Type locality, off Cohasset, Massachusetts.

This species is the type of Astyris H. & A. Adams and is figured and discussed by Grant and Gale.

Mitrella amiantis (Dall),1919. Kyska Harbor, Aleutian Islands, Alaska.

Mitrella permodesta (Dall),1890. Unalaska, Aleutian Islands, south to San Diego, Calif. in deep water. (Dall). Oldroyd gave the type locality in error as near the Galapagos Islands. Dr. A. Myra Keen advises " Mrs. Oldroyd miscopied the type locality of Mitrella permodesta. It should be Station 2840, off Santa Barbara Islands, California, 276 fathoms."

Mitrella hypodra (Dall),1916. Puget Sound to Puerto Libertad,West Mexico. (Dall). Type locality, San Diego, Calif.

Mr. A.M. Strong comments on this as follows: " I have specimens identified by Dall from the giant kelp off Catalina. I think it is a good species." This was in answer to a question made by John Q. Burch in the preliminary discussion. We have collected a small thin species, in our experience on off shore floating kelp which we have had identified as hypodra. We collected large numbers of these from the kelp about 3 miles off Ensenada in Todos Santos Bay. While it is true that they fit the description, and the species seems to be well figured in Oldroyd, the natural question is whether they are the young of carinata in the first place. And if not perhaps they may be a form of carinata caused by the habitat and would have been normal carinata had they originated on shore. All records we have of hypodra are from this off shore kelp. However, the consensus of opinion seems to be that it is a good subspecies if not a good species.

Dr. Dall placed the following two species in the genus *Nitidella* Swainson,1840. The majority opinion on this matter is well stated by Mr. A.M. Strong " Mitrella gouldii (Carpenter)- Carpenter placed this in *Nitidella*, an east coast genus with plaits on the columella. Dall also used this name for west coast shells but said that in them the plaits were obsolete. Our shells certainly show no sign of plaits." Grant and Gale,1931, p.695 also state " The margin of the oblique truncation on the lower part of the columella of *gouldii* has a small, low ridge or marginal plait which is unlike the plication on the columella of typical *Nitidella nitida* (Lam.), and *gouldii* is probably not genetically related to *Nitidella*. The shape of the entire shell and particularly the oval aperture require its being placed with *Mitrella*."

Mitrella gouldii (Carpenter),1857. Kodiak, Alaska to Manuel's Lagoon, L.C. (Jordan). Type locality, Santa Barbara, Calif.

Collecting data: The body whorl of this species is more ventricose and it is unmistakable. Our experience has been to find it a deep water species bringing it up in considerable numbers but from below 50 fathoms off Redondo Beach, our deepest record being 80 fathoms. (Burch); Craig and Forrester Island, Alaska in 15 to 30 fathoms (G. Willett); Kodiak Island in 15 fms.; Prince William Sound (Lewis) (Willett); near Orcas Island, Puget Sound in 10-30 fms. (Fred Baker); Victoria, B.C. (Lowe).

Mitrella lutulenta (Dall), 1919. Fuca Strait to Coronado Islands. Type locality, Gulf of the Farallones, off San Francisco,Calif. in 24 fms.

Dr. Dall in Bulletin 112 was followed by Mrs. Oldroyd and others in spelling this species *luculenta*. However, the original description in Proc. USNM vol.56,p.331 spelled it *lutulenta*.

Additions and Corrections

Mitrella hypodra (Dall),1916 - add to locality records on previous page- No. Id., Los Coronados, Mex. (Frank Stephens); So. Id. , Los Coronados, Mex. in 4 fathoms (Fred Baker); Isthmus Cove, Catalina on kelp (Strong); San Bonito Island, Lower Calif. in 10 fms. (H. N. Lowe).

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Genus *Anachis* H. & A. Adams,1853. Type (by subsequent designation, Tate,1875), *Columbella scalarina* Sowerby.

" Shell like that of *Pyrene* but with axial ribs and in many cases smaller".

The following key to species and list from Mr. A.M. Strong's notebook covers the entire coast. We will then take up a more detailed discussion of the species recorded north of San Diego.

Shell more than one half inch in length
. Spiral sculpture faint or wanting on the spire
.. Axial ribs nodulous at the shoulder or suture.
... Axial ribs short, not continuous over the whorls
.... Axial ribs straight
Yellowish white with zigzag dark lines
13 x 6 mm. Cerros Island to Panama .... *coronata*
.... Axial ribs curved on the body whorl
White with close longitudinal chocolate markings
21 x mm Panama to Peru .... *fluctuata*
... Axial ribs continuous to the periphery
.... Axial ribs narrow, sharp
Yellowish white, two spiral bands of chestnut spots
18 x 6 mm Lower Calif. to Panama .... *lyrata*

.... Axial ribs narrow, sharp
Yellowish brown, closely reticulated with chestnut
16 x 7 mm. Gulf of California to Chile........... *varicosa*
.... Axial ribs flattened in the middle
Purple brown, spotted or banded with white
16 x 8 mm. Mazatlan .... *pachydermata*
.. Axial ribs not nodulous at the shoulder
... Axial ribs fine, close spaced
Variously marbled, with an ill-defined central white band
25 x mm. Gulf of California to Panama .... *varia*
... Axial ribs strong, wide spaced
.... Spiral sculpture confined to the canal
Pale brown or white
15 x 6 mm. Galapagos .... *fusidens*
.... Spiral sculpture on both base and canal
..... Axial ribs on the body whorl 11, on the spire 20
Blackish with a peripheral band of white blotches
13.5 x 5.5 mm. Gulf of California .... *sanfelipensis*
..... Axial ribs about 13 on all whorls
Flesh colored with blotches of brown between the ribs
17 x 6.5 mm. Nicaragua .... *decimdentata*
. Spiral sculpture distinct on all whorls
.. Axial ribs nodulous at the shoulder or suture
... Axial ribs confined to the upper half of the body whorl
Whitish, chocolate clouding on the back of the body whorl
18 x mm. Gulf of Calif. to Peru .... *rugosa*
... Axial ribs continuous to the periphery
.... Whorls strongly swollen below the suture
Nearly black with a white peripheral band
13.5 x 6.5 mm. Panama .... *gilva*
.... Whorls shouldered, somewhat inflated
Brown with a white band below the suture
22 x 10 mm. Gulf of California to Panama .... *scalarina*
.. Axial ribs not nodulous at the shoulder
...?
Yellowish white, two spiral rows of brown spots nodulous
20 x mm. Gulf of California to Peru .... *lentiginosa*
...?
Covered with irregular chocolate markings
13 x mm. Panama to Peru .... *rugulosa*
...?
Blackish brown, ribs yellowish
15 x mm. Central America .... *pardalis*
Shell from one fourth to one half inch in length
. Spiral sculpture faint or wanting on the spire
.. Axial ribs nodulous at the shoulder or suture
... Ribs becoming obsolete on the body whorl
White with longitudinal chestnut streaks or spots
10 x mm. Peru .... *suffusa*
... Ribs becoming obsolete toward the middle of the whorls
White and chestnut in alternating interrupted bands
10 x mm. Galapagos .... *varians*
.. Axial ribs not nodulous at the shoulder
... Spiral sculpture confined to the canal
.... Axial ribs 11-12, rather broad, rounded
White, narrow brown spiral lines and peripheral spots
8 x 3.5 mm. Gulf of California .... *bartschi*

.... Axial ribs about 14, narrow, sharp
White
9 x 3.5 mm. Salina Cruz .... phanea
... Spiral sculpture on both base and canal
....?
Mottled reddish brown, a peripheral row of white spots
7.5 x 3 mm. Panama .... gracilis
....?
Blackish with waved yellowish axial lines
10 x 5 mm. Gulf of California .... nigrofusca
. Spiral sculpture distinct on all whorls
.. Axial ribs nodulous at the shoulder or suture
...?
Dark chocolate with a white sutural band
9 x mm. Gulf of California .... spadicea
...?
White, punctate with black
11 x 6 mm. Panama .... nigropunctata
.. Axial ribs not nodulous at the shoulder
... Spiral sculpture of raised cords
.... Axial ribs about 16
Flesh colored, blotched and streaked with brown
7.7 x 3.4 mm. Ecuador .... whitei
.... Axial ribs about 20
Marbled with black , yellow and white nodulous
8.3 x 3.9 mm. Nicaragua .... hilli
.... Axial ribs indistinct, undulated
Brownish, maculated with purple
7 x 3 mm. Mazatlan .... serrata
... Spiral sculpture of incised lines
.... Axial ribs extending to the canal
Nearly black with 10 lighter colored ribs
9 x 3.5 mm. Nicaragua to Panama .... carmen
.... Axial ribs fading out at the base
..... Axial ribs 7 ot 8
White with fuscous lines or maculations
6.5 x 3 mm. Acapulco .... humerosa
..... Axial ribs 10 to 20, distinct
...... All incised spiral lines cutting the ribs into nodules
Irregularly mottled with brown, orange and flesh color
7 x 3.3 mm. Panama .... tabogaensis
...... A single incised line cutting the posterior end of ribs
Black, sometimes with a light median band
8 x mm. Panama .... nigricans
...... Incised spiral lines confined to the interspaces
.... All sculpture obsolete on the back of the body whorl
Blackish, lighter on the back of the body whorl
7.5 x 2.75 mm. Panama .... moesta
.... ?
Dark chocolate, obscurely spotted with white nodules
10 x mm. Panama and Galapagos .... atramentaria
.... ?
Yellowish brown with a chestnut superior band
8 x mm. Central America .... milium
..... Axial ribs numerous, fine, principally on upper whorls
......?
With alternating white and brown spiral bands
6.2 x 2.75 mm. Gulf of Calif. to Galapagos .... incerta

......?
Pale, flamed and spotted with fulvous orange
12 x mm. Central America to Galapagos ...... elegantula
Shell less than one fourth inch in length
. Spiral sculpture faint or wanting on the spire
.. Axial ribs nodulous at the shoulder or suture
... Yellowish, fine lines and blotches of chestnut
6 x 3 mm. Gulf of California .... taeniata
.. Axial ribs not nodulous at the shoulder
... Axial ribs distinct, extending to the periphery
.... Axial ribs oblique
White, with three spiral rows of chestnut spots
6 x 3 mm. Gulf of California to Peru .... pygmaea
.... Axial ribs nearly vertical
..... ?
Uniformly reddish brown
23 mm. Gulf of Calif. to Panama .... fulva
..... ?
Whitish, base deep orange red
3.5 x 2 mm. Mazatlan .... rufotincta
.....?
White, with blood red spots
6 x mm. Central America .... cruentata
.... Axial ribs obsolete on the upper part of the whorls
White with two broad brownish orange bands
5 x 2.5 mm. Panama .... conspicua
.... Axial ribs indistinct
Greenish white with zigzag chestnut lines
3.25 x 1.5 mm. Mazatlan .... albonodosa
. Spiral sculpture distinct on all whorls
.. Axial ribs nodose at the shoulder or suture
... White, tinged with orange below the suture
5 x 2 mm. Cape San Lucas .... tincta
..Axial ribs not nodulous at the shoulder
... Incised spiral lines cutting the axial ribs
....?
Yellowish, with the base and canal chestnut
4 x 1.75 mm. Gulf of Calif. to Panama .... diminuta
.... Axial ribs about 12
Yellowish, marbled with chestnut
5 x 2 mm. Santa Barbara to Gulf of Calif. .... penicillata
.... Axial ribs about 16
Chestnut, darker on the posterior half of the base nodulous
6 x 3 mm. Ecuador .... strongi
.... Axial ribs about 20
Flesh color, anterior third of the base brown
5.3 x 2.8 mm. Ecuador .... reedi
... Incised spiral lines confined to the interspaces
.... Axial ribs distinct
..... Axial ribs about 15
Yellowish, a zone of chestnut spots above the periphery
6 x 3 mm. Panama .... dalli Bartsch
.....Axial ribs about 12 .... sinaloa S. & H.
.... guerroenis S. & H.

..... Axial ribs about 20
Purple brown, maculated with white
3.25 x 1.25 mm. San Pedro to San Diego .... subturrita
.... Axial ribs faint, subobsolete
Livid, shining, with a chestnut band
3.25 x 1.1 mm. Cape San Lucas .... fuscostrigata

Not placed in the Key

Columbella boivini Kiener - Coq. Viv. pl.11, fig.5; Famille des Purpuriferes, p.3, pl.11, fig.1. Sowerby, Thes. Conch.,pl.38, p.126, fig.100. Reeve,Conch. Ic. pl. sp.43. Tryon, Man. Conch. vol.5, p. 112.
Tryon gives C. sowerbyi as a synonym.
Columbella vexillum Reeve. Conch. Ic. pl. fig.57. Given as of Sowerby by later authors. Carpenter, SMC,p.567 says no authority.
Columbella encaustica Reeve. Conch. Ic. pl. sp.56. Tryon, vol.5, p.164, questions the locality.
Anachis tilamen Dall. Find no reference to a description.
Anachis adelinae Tryon. Tryon, vol.5, p. Very doubtful if west coast.
Columbella pariolida Duclos. Tryon, vol.5, p.168, gives equals atramentaria.
Columbella deshayesi DeFolin. Fronds de la Mer., vol.1, pl.11, pl.1, fig.5. May be a form of A. pygmae.
Anachis nigricans Sby. Omitted from key.

List of Species of Anachis

Anachis coronata (Sowerby),1832.	Cerros Island to Panama
Anachis rugosa (Sowerby),1832.	Gulf of Calif. to Peru
Anachis lentiginosa(Hinds)1844	Gulf of Calif. to Peru
Anachis scalarina (Sowerby),1832.	Gulf of Calif. to Panama
Anachis varicosa (Haskoin),1852 (costellata)	Gulf of Calif. to Chile
Anachis lyrata (Sowerby),1832. (terpsichora)	Gulf of Calif. to Peru
Anachis varia (Sowerby),1832.	Gulf of Calif. to Panama
Anachis nigrofusca (Carpenter),1857.	Gulf of California
Anachis spadica(Philippi)1846.	Gulf of California
Anachis pachydermata (Carpenter), 1857.	Gulf of California
Anachis gilva (Menke)	Gulf of California to Central America.
Anachis vexillum (Reeve)	Gulf of California
Anachis hilli Pilsbry & Lowe,1932.	Gulf of California
Anachis sanfelipensis Lowe,1935.	Gulf of California.
Anachis decimdentata Pilsbry & Lowe	Nicaragua
Anachis varians (Sowerby),1832.	Galapagos
Anachis nigropunctata (Sowerby),1832.	Galapagos
Anachis elegantula (Morch)	Galapagos
Anachis fusidens Dall,1908.	Galapagos
Anachis suffusa (Sowerby)	Peru
A. (Seminella) penicillata Carpenter,1865.	San Pedro to Gulf of Calif.
A. (Seminella) subturrita Carpenter,1866.	San Pedro to Tres Marias Islands
A. (Seminella) fredbakeri Pilsbry.	Lower California
A. (Seminella) pygmaea (Sowerby),1832.	Gulf of Calif. to Peru.
A. (Seminella) carmen Pilsbry & Lowe,1932.	Gulf of Calif. to Panama.
Anachis s.s. fulva (Sowerby),1832.	Gulf of Calif. to Panama
Anachis (Seminella) nigricans (Sowerby),1844.	Gulf of Calif. to Panama
A. (Seminella) diminuta (C.B. Adams),1852.	Gulf of Calif. to Panama
A. (Seminella) serrata Carpenter,1857.	Magdalena Bay
A. (Seminella) albonodosa Carpenter,1857.	Gulf of California
A. (Seminella) taeniata (Philippi)	Gulf of California
A. (Seminella) bartschii Dall	Cape San Lucas

(con.)

A. (Seminella) fuscostrigata Carpenter,1864.	Cape San Lucas
A. (Seminella) tincta Carpenter,1864.	Cape San Lucas
A. (Seminella) rufotincta Carpenter	Mazatlan
A. (Seminella) inserta (Stearns),1892.	Gulf of Calif. to Galapagos
A. (Seminella) humerosa Carpenter,1865.	Acapulco.
A. (Seminella) sinaloa Strong and Hertlein	Gulf of California
A. (Seminella) guerroensis Strong & Hertlein	Acapulco
A. (Seminella) treva B. H. & S.	Tres Marias Islands
A. (Seminella) phanea Dall,1919.	Salina Cruz
A. (Seminella) milium Dall	Central America
A. (Seminella) cruentata (Morch),1861	Central America
A. (Seminella) conspicua (C.B. Adams),1852.	Panama
A. (Seminella) gracilis (C.B. Adams),1852.	Panama
A. (Seminella) moesta (C.B. Adams),1852.	Panama
A. (Seminella) atramentaria (Sowerby),1844.	Galapagos
A. (Seminella) tabogaensis Bartsch,1931.	Panama
A. (Seminella) dalli Bartsch,1931.	Panama
A. (Seminella) whitei Bartsch,1928.	Ecuador
A. (Seminella) reedi Bartsch,1928.	Ecuador
A. (Seminella) strongi Bartsch,1928.	Ecuador
Anachis fluctuata (Sowerby)	Corinto to Peru
Anachis rugulosa (Sowerby)	Panama to Peru

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Genus Anachis H. and A. Adams,1853

Subgenus Seminella Pease,1867. Amer. Jour. Conch., vol.3, p.234.
" C. miser, pacifica etc. are not very closely related to the strongly-ribbed Panamic forms, nor to the small irridescent species of Polynesia. I would therefore propose that the latter should be separated under the name of Seminella."

There has been a great deal of discussion about the proper allocation of the two small species in our fauna, penicillata and subturrita. They are questionably in the genus Anachis, but if they do belong here they should certainly be placed in a distinct subgenus and authorities differ widely. Grant and Gale place them in subgenus Chauvetia Monterosato,1884 but not less than a dozen other names have been suggested. Mr. A.M. Strong uses Seminella but states of our species (Per. Comm. July,1945) " Anachis penicillata Carpenter- This probably does not belong in Anachis. It may belong in Nassarina or some related genus." Dr. A. Myra Keen comments (Per. Comm. July,1945) " Seminella Pease ... was proposed in a very vague manner. It seems to apply to Polynesian species rather than West American. Baker,Strong and Hanna, 1938, p.246 place it in synonymy of Anachis."

We feel obliged, therefore, to simply leave our species under Anachis with no subgeneric or generic change until some student makes a more careful study of the problem.

Anachis penicillata Carpenter,1865. Pescadoro Pt., San Mateo Co. (Smith) Santa Barbara, Calif. to the Gulf of California. Type locality " Santa Barbara, San Diego, Catalina Island".

" This species is easily distinguished from subturrita Carpenter by its more elongate aperture, longer columella, and stronger sculpture. A. subturrita has an unusually short columella" (Grant and Gale).

Collecting data: Our experience has been to find this a relatively common small species both litterol and dredged. It was very abundant on the bridge pilings at Anaheim Landing, common in the rocky rubble all along the Palos Verdes Hills from Malaga Cove to Pt. Firmin, San Pedro breakwater and also the Balboa breakwater, the rubble reef at San Onofre, and also Punta Banda and other rocky localities around Todos Santos Bay.

It was common at San Simeon, Calif. in the rubble. We brought it up in the dredgings off Santa Monica in 10 to 15 fms., Redondo Beach in 15 to 25 fms., Avalon, Catalina Island in 25 fms. (Burch) ; reported from Monterey by C Cooper but we have not found it there. I have specimens from Pescadero Pt. San Mateo Co., which I believe is an extension of range (A.G. Smith); San Diego (Hemphill and F. Baker); So. Id., Los Coronados in 14 fms. (Baker); San Martin Island, Lower Calif. (Baker); San Geronimo Id., L.C. (Lowe); La Jolla (Chaney); Ocean Beach (Kelsey); Bird Rock (Strong).

Anachis subturrita Carpenter,1866; San Pedro to Tres Marias Islands, Mex. Type locality, San Diego, Calif. in shell washings.

Collecting data: Todos Santos Bay,L.C. (Hemphill); San Hipolito, L.C. (Hemphill); San Diego (Lowe); San Clemente Island (Lowe).

Genus *Aesopus* Gould,1860. Type (by monotypy), *Aesopus japonicus* Gould.

" Shell small, rather thick for its size, subcylindric, terminating in a blunt apex; body whorl scarcely larger than the penultimate whorl; whorls slightly convex; sutures not deeply impressed; surface shiny, vitreous; sculpture inconspicuous or microscopic, consisting of very low axial ribs and spiral striations , absent in some places; aperture small, one-third or less the length of the shell, elongate-ovate, tending to be effuse below and narrowing above; outer lip typically simple but occasionally with denticulations withih; inner lip a vitreous callus deposit; columella short; anterior canal not differentiated from the anterior part of the aperture; posterior canal undeveloped."

The following key to species of *Aesopus* is from Mr. A.M. Strong's notebook. Following his list of species we will take up a more detailed discussion of the species north of San Diego.

Genus *Aesopus* Gould,1860.
All sculpture obsolete
. Greenish-waxen, with chestnut flamules
12 x 3.3 mm. Monterey .... *goforthi*
Oldroyd, vol.2, part 1, p.280
. Faintly flamed and tinged with orange, apex pink
10 mm. Gulf of California .... *babbi*
Tryon, vol.5, p. 135
Axial ribs present
. Spiral sculpture absent
.. Axial ribs numerous, faint .
Yellowish, whitish or ocellated with pale brown
7 x 2 mm. Magdalena Bay to Guadalupe Island .... *arestus*
Proc. USNM, vol. 56, p. 332.
.. Axial ribs distinct, about 20 in number
White, with brown maculations
7.5 x 2.75 mm. San Diego to Panama .... *eurythideus*
Oldroyd, vol.2, part 1, p. 278
.. Axial ribs about 16
7.4 x 2 mm. San Juan del Sur .... *fredbakeri*
Proc. Phil. Acad. Sci. vol.84, p.14
. Spiral sculpture of fine striae, axial ribs nodulous
White, with a brown zone below the periphery
7.5 x 2.2 mm. Acapulco .... *xenicus*

(con.)

Axial sculpture absent
. Entire surface with minute, even, spiral striations
.. Light pinkish brown
4.3 x 16 mm San Pedro to Cape San Lucas ...... sanctus
Oldroyd, vol.2, part 1, p. 279
.. White with longitudinal brown streaks
8 mm. Peru .... oblita
Tryon, vol.5, p. 123
. Entire surface with strong, spiral grooves
.. White or yellowish, sometimes brown tinted
9.25 x 3.5 mm. San Pedro to San Diego .... chrysalloideus
Oldroyd, vol.2, part 1, 279
.. Whitish, tinged or spotted with brown
4 mm. San Pedro to Pt. Abreojos .... myrmecoon
Oldroyd, vol.2, part 1, page 279

Aesopus chrysalloideus (Carpenter),1864.	San Pedro to San Diego
Aesopus sanctus Dall,1919.	San Pedro to Cape San Lucas
Aesopus myrmecoon Dall,1916.	San Pedro tp Pt. Sbreojos
Aesopus eurytoideus (Carpenter),1864.	San Diego to Panama
Aesopus goforthi Dall,1912.	Monterey
Aesopus arestus Dall.	Magdalena Bay
Aesopus babbi Tryon.	Gulf of California
Aesopus xenicus Pilsbry & Lowe,1932.	Gulf of California
Aesopus oblita Reeve	Peru
Aesopus fredbakeri Pilsbry & Lowe,1932.	San Juan del Sur

Aesopus eurytoideus (Carpenter),1864. San Diego to Panama. Type locality, Cape San Lucas, Lower Calif.

Dr. A. Myra Keen advises regarding the spelling of this specific name " Both eurytoidea and chrysalloidea were proposed under a genus of feminine gender. When transferred to Aesopus, the ending should change to -us rather than -s. " So. Id., Los Coronados,Mex. 3 fms. (F. Baker).

Aesopus chrysalloideus (Carpenter),1864. Santa Monica, Calif. (Burch) to San Diego. Type locality, San Pedro and San Diego.

Collecting data: Dredged off Santa Monica, Calif. in 10 fms. (Burch); Ballast Point, San Diego Bay in 10 fms. (Baker); San Diego Bay in 5 fms. (Kelsey); San Pedro (Lowe).

San Martin Id. L.C.
Aesopus sanctus Dall,1919. Santa Monica, Calif. (Burch) to
. Type locality, Todos Santos Bay.

Collecting data: Dredged in 20 fms. off Santa Monica, Calif. 8/38 (Burch); South Island, Los Coronados in 14 fms. (Baker); Point Vincent, Calif. (Strong); Whites Point, Calif. (Strong); San Martin Island, L.C. (Baker)

Aesopus myrmecoon Dall,1916. Malaga Cove, Santa Monica Bay, Calif. (Burch) to Point Abreojos, L.C. Type locality, San Pedro, Calif.

Collecting data: Malaga Cove, Santa Monica Bay littoral in rubble in March and Sept.; El Morro Pt. north of Ensenada,Mex. (Burch); So. Id. Los Coronados in 3 fms. (Baker); Laguna Beach (Lowe).

Aesopus goforthi Dall,1912. Monterey, Calif. (Goforth).
" Reported from Monterey by Cooper but we have not seen it there. I have a strong suspicion that it did not come from Monterey but from farther south. In the original description the Monterey locality was questioned by Dall " (A.G. Smith).

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Genus Amphissa H. and A. Adams, 1853. Type (designated by Dall,1913), Buccinum corrugatum Reeve,not Buccinum corrugatum Brocchi,1814 - Amphissa columbiana Dall. (fide Grant and Gale, p. 700).
" Shell of moderate size, elongate Buccinoid; nucleus small, spire high, whorls ventricose, suture depressed; sculpture of axial ribs and spiral threads or cords; aperture ovate, slightly subquadrate; about half the length of the entire shell; outer lip sharp or slightly thickened internally and generally with small lirations, gently curving but typically nearly straight for a short distance just above the middle of the aperture; inner lip with a callus wash on the body whorl and pillar; columella nearly straight, with typically a few small, short plaits at about the midpoint of the aperture; anterior canal hardly differentiated from the aperture, which is effuse anteriorly; posterior canal not developed."

The following key to some of the species of Amphissa is from Mr. A.M. Strong's notebook.

Axial ribs about 20
  Spiral sculpture of fine lines
    20 x 8 mm. Alaska to San Pedro .... columbiana
Axial ribs about 17
  Spiral sculpture of fine regular cords
    Alaska to San Diego .... reticulata
Axial ribs 14 to 16
  Spiral sculpture of narrow ridges separated by wide interspaces
    12 x 6.5 mm. Oregon to Cedros Island ...... versicolor
Axial ribs 11 to 13
  Spiral sculpture of flattened, strap like cords
    14 x 8 mm. Farralones to San Diego .... bicolor
Axial ribs about 9
  Spiral sculpture of distinct, acute cords.
    11 x 5 mm. Monterey to Coronado Islands ...... undata

The only species discussed by Mr. Strong that is not of our fauna is Amphissa lyrta B.H. and S. from the Gulf of California.

Amphissa columbiana Dall,1916. Chiachi Islands, Alaska to San Pedro,Calif. (Dall). Type locality not selected.

Collecting data: Our experience has been to take this species in Puget Sound, De Poe Bay, Oregon and Crescent City, Calif. (Burch); S.E. Alaska-shore- my columbiana have more and finer ribs than versicolor.(G. Willett); Orcas Island, Puget Sound in 10 to 30 fms. (Baker); Ketron Id.,Puget Sound (Baker); Neah Bay, Wash. (Lowe); Farralones, Calif. and Crescent City,Calif. (Chace); Point Reyes, Calif. (Lowe); Bear Bay, Barranoff Island, Alaska (Kate Stephens); Typical shells of this species are northern. The shells I have been calling columbiana from the Mendocino coast are quite different and are, in fact, much closer to versicolor, although they are not versicolor, typical shells of the latter being found with the larger form. I have taken a very few shells of this large form of Amphissa at Pacific Grove, although it is rare in Monterey Bay. I suspect we have another and unnamed species here but have hesitated to do anything about it as I have not had enough lots of columbiana from the Oregon coast with which to make a check" (A.G. Smith).

Amphissa versicolor Dall,1871. Oregon coast to Cerros Island, Lower Calif. (Dall). Type locality, Monterey, Calif.

Collecting data: It is interesting that we picked up this species on shore or only in very shallow dredgings, under 10 fms. We have picked up the variety incisa in deeper water indicating that perhaps it is the deep water form. Versicolor is a very common species in our experience in rocky rubble all around Santa Monica Bay and at all points south to Todos Santos Bay,Mex. (Burch); Monterey, Calif. (Lowe); San Pedro, Calif. (Lowe); Catalina Island in 30 fms. ? (Lowe); La Jolla, Calif. (Bristol); San Diego (Gripp); Point Cayucos, Calif. (Wilcox); Todos Santos Bay (Orcutt); this is essentially a shore species and not often taken in dredgings. The Amphissas we have dredged on the shale in Monterey Bay we have called A. versicolor incisa because of their more developed sculpture. You might check those you got to s see if our experience checks with yours. Cymata Dall and lineata Stearns are merely color forms in my opinion, with little taxonomic value " (A.G. Smith). Note- we agree with the last except for cymata which we consider very distinct. (Burch).

Grant and Gale placed Amphissa versicolor lineata Stearns,1872, type locality Monterey, in the synonymy of the typical and the consensus of opinion is to accept this verdict.

Amphissa versicolor incisa Dall,1916. Monterey, Calif. (A.G. Smith) to Todos Santos Bay, Mexico (Burch). Type locality, Laguna Beach, Calif.

Collecting data: As suggested under the discussion of versicolor our experience has been to find this form the deeper water form having dredged it all around Monterey Bay in 15 to 25 fms. and off Redondo Beach in 25 fms. off Malaga Cove, Los Angeles Co. in 20 fms. and off Ensenada in Todos Santos Bay in 25 fms. (Burch).

Dr. Dall in Bulletin 112 gives the reference to the description in 1919 but Dr. A. Myra Keen calls attention to his brief description in 1916 in the Nautilus, vol. 30, p.27. " incisa Dall, with sharply cut regular sculpture and beautifully mottled coloration (U.S.N.M. Cat. No. 223,294"

Amphissa cymata Dall,1916. Monterey, Calif. to Dana Point, Orange Co.,Calif. (Burch). Type locality, Monterey, Calif.

Collecting data: This was described very briefly as a variety of versicolor " with distinct brown axially waved lines on a white ground". The shells we have labelled cymata seem to be sufficiently distinct to be a species. In fact, we have often wished we could see the type because our A. cymata is so very different from typical versicolor that it seems as if Dr. Dall would surely have called it a species if he had the same shells. (Burch); an interesting thing about it in our experience has been to find it in the rocky rubble at Dana Point, Orange Co. on several occasions and nowhere else. (Burch); Catalina Island in 40 fms. (G. Willett).

Amphissa reticulata Dall,1916. Port Althorp, Alaska to San Diego, Calif. Type locality, Sta. 4332, 183 fms. off Point Loma.

Collecting data: Dredged in 25 fms. off Redondo Beach and also brought up from below 50 fms., off Malaga Cove and also off Avalon, Catalina Island in 35 fms. We have a set from Puget Sound dredged by Trevor Kincaid and we collected a few specimens in littoral collecting at Monterey, Calif. in rocky rubble at low tide. This is a common species in the Del Rey deposit of the Baldwin Hills Pleistocene (Burch); Craig and Forrester Island, Alaska (Willett

Catalina Island, Calif. in 35 fms. (Strong); Craig, Alaska in 20-25 fms. (Lowe); 10-40 fms. Monterey Bay, scarce. Close to A.V. incisa. (A.G. Smith)

Amphissa undata (Carpenter),1864. Monterey, Calif. to Cerros Island, Lower Calif. Type locality, Catalina Island in 30-40 fathoms.

Collecting data: In our experience this is a comparatively common species from moderately deep water. Our records show , off Monterey in 20 fms., Santa Cruz Island in 50 fms., Redondo Beach 25 to 75 fms., Avalon, Catalina Island in 35 fms., Todos Santos Bay, Mexico in 50 fms. (Burch);

Monterey Bay in 15-40 fms. scarce. 150 fms. o ff La Jolla (A.G. Smith); Catalina Island, Calif. in 30 fms. (Lowe); San Diego, Calif. in 100 fms. (Kelsey).

Amphissa bicolor Dall,1892. Farralones Islands to San Diego, Calif. Type locality, deep water off southern California.

Collecting data: Off Redondo Beach, Calif. in 75 to 100 fathoms (Burch); Catalina Island in 40 fms. (G. Willett); 66 to 356 fms. in Monterey Bay and 298 fms. off Pt. Sur (USFC), common (A.G. Smith); San Diego, Calif. (Baker); Orange Co., Calif. in 15 fms. (Lowe).

Amphissa sp. - Mr. A.G. Smith reports " I have several lots of a small, slender shore form from Reef Pt., White's Pt., La Jolla, and the North Id. breakwater. " Mr. Smith suggests that this is what we have been calling cymata. If so and it sounds logical we suggest that Mr. Smith describe it.

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Genus Strombina Morch,1852. This genus is not represented north of San Diego, but we are including Mr. A.M. Strong's key to species and list of species.

Outer lip sinated in the middle
Cape San Lucas .... sinuata
Tryon, vol. 5, p. 152
Outer lip sinated at the posterior end of the aperture
. Sinus deep and rounded Gulf of California .... clavulus
Reeve, Pleurotoma, pl. 12, sp. 106
. Body with a tooth notching the aperture at the sinus
16 mm. Acapulco to .... hiroundo
Reeve, sp. 219, Columbella
Outer lip only slightly sinated or not at all
. Axial sculpture absent
.. Spiral sculpture confined to the base and canal
... Body whorl with prominent humps
.... A hump on the back, outer lip thickened externally
28 mm. Gulf of California to Panama .... dorsata
Tryon, vol.5, p. 185
.... White humps on back and sides
16 mm Lower Calif. to Peru .... gibberula
Tryon, vol.5, p. 184

(con.)

... Body whorl with the humps small or wanting
.... Shoulder of the body whorl with a row of tubercles
25 mm. Gulf of California to Central America ... maculosa
Tryon, vol.5, p. 186
.... Body whorl corronated at the suture with 9 pustules
37 x 10.8 mm. Cerros Island to Gulf of Calif. .. paceana
Nautilus, vol.30, p. 28
... Body whorl without tubercles or pustules
.... Aperture whitish, not dentate
35 x 13 mm. Central America to Ecuador .... turrita
Tryon, vol.5, p. 186
.... Lip callously thickened, dentate within
22 x 11 mm. Gulf of California to Panama .... pavonia
Tryon, vol.5, p. 185
.. Spiral sculpture not confined to base and canal
... Spiral lines on later whorls only
15 x 7 mm. Gulf of California to Ecuador ..... solidula
Tryon, vol.5, p. 147
... Shoulder defined by a carina, spirals strong (?)
37 x 15 mm Gulf of California .... colpoica
Nautilus, vol. 30, p.28 equals subulata Sby. not Reeve says Strong
. Axial sculpture present
..Spiral sculpture confined to the base and canal
... Axial sculpture on the first few whorls only
.... Canal long, body whorl with a hump
40 x 14 mm. Central America .... fusinoidea
equals fusiformis Hinds, voy. Sulphur pl.10, f.17, Not Reeve
.... Canal shorter, body whorl without a hump
34 x 13.5 mm. Gulf of California to Panama ..... edentula
Bull. Mus. Comp. Zool., vol. 43, p. 310
... Axial sculpture distinct on all whorls
.... Axial ribs 10, canal long
32.2 x 11.7 mm. Gulf of Calif. to West Mexico .. subangulata
Trans. San Diego Soc. N.H. vol. 8, p.21
.... Axial ribs 14, canal short
32 mm Panama .... angularis
Tryon, vol.5, p. 186
.... Axial ribs 18, canal short
19 x 7.5 mm. Cape San Lucas .... bonita
.... Periphery of last whorl rounded
..... Shell short and broad
30 mm. Central America to Ecuador .... recurva
Tryon, vol.5, p. 187
..... Shell slender, turrited
...... Axial ribs regular, rather close
37.5 mm Central America .... elegans
Tryon, vol.5, p. 186
..... Panama to Peru .... lanceolata
Reeve, pl.1, fig.3
.. Spiral sculpture not confined to the base and canal
... Axial sculpture of blunt riblets on the last whorl only
14 x 7 mm. Gulf of California to Ecuador .... solidula
Tryon vol.5, p. 147
... Axial riblets extending over several whorls
.... Spiral sculpture of strong, channeled grooves
25 mm Gulf of Calif.............................. lilacina
Nautilus vol.30, p.28; Proc. USNM, vol.66, pl.35, f.5

.... Spiral sculpture of cords or raised threads

..... Spire short, sharp pointed

23 mm. Gulf of Calif. to Central America ... pulcherrima

Reeve, pl.3, fig.10

..... Spire long, turrited

30 x 11 mm Gulf of California .... carmencita

Trans. San Diego Soc. N.H., vol. 8, p.21.

List of species of Strombina

Strombina gibberula (Sowerby),1832.	Lower Calif. to Peru
Strombina maculosa (Sowerby),1832.	Lower Calif. to Panama
Strombina paceana Dall,1916.	Cerros Island to Gulf of Calif.
Strombina solidula(Reeve).	Magdalena Bay to Ecuador
Strombina lilacina Dall,1916.	Gulf of California
Strombina colpoica Dall,1916.	Gulf of California
Strombina edentula Dall,1908.	Gulf of Calif. to Panama
Strombina dordata (Sowerby),1832.	Gulf of Calif. to Ecuador
Strombina clavulus (Sowerby),1832.	Gulf of California
Strombina carmencita Lowe,1935.	Gulf of California
Strombina subangulata Lowe,1935.	Gulf of Calif. and West Mexico
Strombina bonita String and Hertlein.	Cape San Lucas
Strombina pulcherrima (Sowerby)	Tres Marias Islands to Central Amer.
Strombina turrita (Sowerby),1832.	Acapulco to Ecuador
Strombina hirondo (Gaskoin)	Acapulco
Strombina recurva (Sowerby),1832.	Acapulco to Ecuador
Strombina sinuata (Sowerby),1874.	Acapulco
Strombina fusinoides Dall	Acapulco to Central America
Strombina elegans (Sowerby),1832.	Central America
Strombina lanceolata (Sowerby),1832.	Panama to Peru
Strombina pavonia (Hinds)	Panama
Strombina angularis (Sowerby),1832.	Panama

Genus Cosmioconcha Dall,1913. This genus is not represented north of San Diego. The following key and list of species is from Mr. A.M. Strong's notebook.

Axial sculpture absent

. Spiral sculpture of 6 or 7 cords on the base

19 x 9 mm. Gulf of California .... palmeri

Proc. USNM. vol. 66, pl.21, fig.8; Proc. USNM, vol.45, p.589.

. Spiral sculpture of about 20 grooves on the base

.. Whitish, with brown flames

24 x 7 mm. Gulf of California .... pergracilis

Proc. USNM, vol.45, p. 590; Proc. USNM, vol. 64, pl.21, fig.9

.. Uniformly pale olivaceous

15 x 5 mm. Gulf of California .... parvula

Proc. USNM, vol.45, p. 590; Proc. USNM, vol. 66, pl.21, fig.1

. Spiral sculpture ?

.. Whitish or yellowish, stained with chestnut

24 x 10 mm. Central America to Panama .... modesta

Tryon, vol.4, p. 10

.. Nearly black, white spots on the periphery

18 x mm. Peru and Chile .... buccinoides

Tryon, vol. 5, p. 127

List of species of Cosmioconcha

Cosmioconcha palmeri Dall, 1913.	Gulf of California
Cosmioconcha pergracilis Dall, 1913.	Gulf of California
Cosmioconcha parvula Dall, 1913.	Gulf of California
Cosmioconcha modesta (Lowys), 1835.	Panama
Cosmioconcha buccinoides (Sowerby), 1832.	Peru

Additions and Corrections

#51, p.12- Pyrene fuscata (Sowerby), 1832. Perhaps we should call attention to the fact that Dr. Dall listed this species from La Jolla, Calif (Orcutt) in Add. & Emend. to USNM Bull. 112, Proc. USNM, vol.63, art. 10. However, there is no question but that this is an error. P. fuscata is definitely of the southern fauna.

The following collecting records were received from Mr. A.G. Smith after the stencils were cut. Please add them .

Nassarius fossatus (Gould)- Elkhorn Slough; 10 fms. off Del Monte, in sand rare; Duxbury Reef; common in shallow water all along the Mendocino Co. coast.

Nassarius californianus (Conrad)- 30-40 fms. off Moss Landing, Monterey Bay; also off Soquel Pt.; rare in the Bay. Common in shallow water along the Mendocino Co. coast but full-grown specimens are not often taken. In the young stages, californianus is sometimes difficult to distinguish from perpinguis, but normally can be separated by the more pronounced rougher sculpture.

Nassarius mendicus (Gould)- and N. m. cooperi (Forbes)- Both the species and the subspecies common in Monterey Bay and in moderately shallow water along the Mendocino Co. coast.

Nassarius perpinguis (Hinds)- Common in Monterey Bay from 5 to 25 fms.

Nassarius insculptus (Carpenter)- 40-73 fms. off Pt. Pinos (USFC), scarce; 35 fms. Cordell Bank.

Nassarius tegulus (Reeve)- Not found in Monterey Bay. I have grave doubts about the San Francisco record, having seen no specimens from this Bay either.

Nassarius obsoletus (Say)- Common in the Oakland Estuary and on the Alameda shore in San Francisco Bay.

Mitrella carinata and subspecies- San Francisco Bay; Sausalito; Little River, Mendocino Co. (mostly the form gausapata).

Mitrella aurantiaca Dall- Avalon (one specimen); Pt. Pinos; 11 mi. N. of Ft. Bragg. A scarce species.

Mitrella tuberosa (Carpenter)- Shore to 20 fms. in Monterey Bay, abundant.

Mitrella hypodra (Dall)- One beach-worn specimen from Monterey (Dall)

Mitrella gouldii (Carpenter)- 39-356 fms. in Monterey Bay (USFC), fairly common.

Mitrella luculenta (Dall)- 10-73 fms. in Monterey Bay, common. Also common in moderate to fairly deepwater off the Mendocino coast.

Additions to Min. #50, pp 20-27-

Neptunea tabulata (Baird)- 50-80 fathoms off Moss Landing; 202 fms. off Watsonville beach (USFC Sta. 3204); taken by set-line fishermen in 200 fms. off Davenport, Santa Cruz Co. A scarce species.

N. amianta (Dall)- 42 fms. off Pigeon Pt. (Bolin); 278-871 fms. in Monterey Bay (USFC); 200 fms. off Davenport (Strohbeen, from set-line fishermen). A scarce species.

N. ithia (Dall)- 204-382 fms. off Pt. Sur, Pt. Pinos, and in Monterey Bay (USFC); 200 fms. off Davenport (Strohbeen, from set-line fishermen) A scarce species.

N. lirata (Martyn)- An immature specimen in 755-847 fms. off Pt. Pinos (USFC).

Additions and Corrections- (con.) Mr. A.G. Smith

Searlesia dira (Reeve)- Min. #50 p 23- " The Monterey record is based on a single worn shell collected by Dall. We have not found it there, although it is reported living at Pigeon Pt., a few miles to the north. Common at Duxbury Reef and all along the Mendocino coast, living on wave washed rock crevices fairly well inshore."

Buccinum strigillatum Dall- 278 fms. in Monterey Bay (USFC), a single specimen.- 125-135 fms. off Ft. Bragg.

Buccinum viridum Dall- 330-870 fms. in Monterey Bay (USFC). This species appears to be common all along the coast from the 400 fathom line on down .

****

We received the following notes from Dr. Joshua L. Baily Jr. after cutting the stencils for our report on Nassariidae and Columbellidae. It is interesting to note that we arrived at the identical conclusions.

" I do not see how anyone can use Nassarius and Arcularia both, since both have the same generitype. However, Tryon in his Manual of Conchology, used Arcularia as a subgenus of Nassa, but put the species Nassa arcularia under Nassa s.s. and not under Arcularia. I believe he was wrong in doing so. There is considerable variation in the genus to warrant possibly eight or ten subgenera, but I am inclined to suspect that even so, until we know more about the soft parts, we should not take the subgenera too seriously . Certainly for our California species two subgenera are sufficient for the present. I would put tegula under Nassarius s.s. and the others under Schizopyga.

The east coast species, Nassarius trivittatus, to my mind resembles our N. perpinguis sufficiently to be classed in the same subgenus, yet N. trivittata is generally called a Tritia . I wonder if Tritia and Schizopyga are synonyms ?

The family name Columbellidae should be used in place of Pyrenidae regardless of whether the two genera are synonymous or not. Columbella has been placed on the Official List of Generic Zoological names, and is therefore to be given priority over Pyrene if the two are considered equal. But Dr. H.A. Pilsbry tells me that in his opinion each is a good genus, Columbella having plaits on the columella which Pyrene does not. We do not have either here, but both occur in the Gulf."

****

Minutes #49,pp 50-51, pl.3, figs. 35-39. We have the following note to add to the data on this species. Dr. Paul Bartsch, Curator, Division of Mollusks and Cenozoic Invertebrates, Smithsonian Institution, U.S. National Museum advises " The type of Spisula strongi Burch has come through in fine shape. We have given it the catalogue no. 573603."

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Minutes #42, p.6 and list #45, p.14- Tivela stultorum (Mawe)- We have the following note from Dr. A.Myra Keen:

" Dr. and Mrs. Gifford have just sent a specimen of Tivela stultorum that was collected in June, alive, at Stinson Beach, Marin Co., Calif. That extends the range of the species one degree northward to lat. 38."

****

Family MURICIDAE

The proper generic and subgeneric arrangement of the species of this family in our fauna has been the subject of rather extensive discussion. No two west coast authors seem to agree in recent years except upon one point and that is that the arrangement used by Dr. Dall in Bulletin 112 is unsatisfactory. Dr. Clench has just published the issue of the Johnsonia " The Genus Murex in the Western Atlantic." Johnsonia #17, May 29, 1945. Clench and Farfabte in this paper retain the generic name *Murex* using sub-genera for all divisions. Powell, Iredale and many others have been giving generic standing to many of the subgenera used. It seems to be the old question of whether to use many genera or many subgenera and sections.

Dr. Joshua L. Baily Jr. advises on the problem (Per. Comm. July, 1945) " To my mind the most difficult family in all the mollusca to deal with is the Muricidae. I anticipate more trouble when I get to it than from any other family. Some yearsago I discussed this with Dr. Stillman Berry, and he expressed the opinion that any arrangement of genera, no matter how carefullt planned, could be nothing more than tentative until the soft parts were better known, and he recommended calling all of them *Murex.* Of course, this does not solve all of the difficulties. It merely reduces them from generic to subgeneric rank. There have been about 20 subgenera of *Murex* names. This is a conservative estimate. A careful count might reveal about twice that number. I presume that your distribution of the species among the subgenera is about as good as any other man's might be, except for one matter. You have placed *Murex gemma* and *Murex festivus* in the same subgenus. I know that Dall did this in Bulletin 112, and Grant and Gale in their catalog did the same, but to me the shell of *Murex gemma* is so different from *Murex festivus* that I would recommend placing them in different subgenera even if their soft parts showed no special difference. Which one of them should be removed I do not know.

May I explain why I used *Ceratostoma* Hermanssen instead of *Purpura* Martyn ? It was on account of Johnson's article in the Nautilus, in which he claimed that Martyn should be rejected as not consistently binomial. But I myself was not consistent for I retained some of Martyn's other names. I feel that it is not wise to reject all of any author's names because some of them are not binomial; I think we should accept the good ones and reject the bad ones. Martyn's work, The Universal Conchologist, is quite rare, perhaps only a half a dozen copies in this country. According to Johnson, each copy differs from every other copy. Consequently there is good ground for rejecting this work. But there is evidence that Martyn published another work on conchology in the same year and I have tried to accept these names in this latter work while rejecting those in the former.

Finally, the figure which purports to be *Murex petri* which Dall published in the Proceedings, and which Keep reproduced in the 1911 edition of West Coast Shells and which I used in the 1935 edition is not *Murex petri* at all. We have authentic specimens of *Murex petri* in the San Diego Museum. I looked the matter up before when Dr. S.S. Berry first called my attention to the erroneous picture, and found that *M. petri* is a very different thing. "

Mr. A.M. Strong advised the editor that the divisions in his notebook are but tentative pending further study. Mr. Strong uses the subgenera of Dall but gives them generic standing. He uses *Jaton* for the three species *gemma, santarosana* and *festivus.*

Dr. A. Myra Keen (Per. Comm. July, 1945) states " Having been interested in the classification of the Muricidae for the last ten years, and having accumulated a lot of notes on the group, I have a few suggestions to make as to allocation of West Coast species. "

Family Muricidae Gray,1824

Genus Murex Linnaeus,1758. Type (Sub. design., Montfort,1810) Murex pecten Montfort - M. tribulus Linnaeus. Clavate, varices spiny. Represented in Panamic fauna by M. recurvirostris Broderip,M. elenensis Dall.

Genus Pterynotus Swainson,1833. Type (monotypy) Murex pinnatus Wood. Trivaricate, varices not spiny. California species: P. (P) erinaceoides; P.(P.) petri; P.(P) rhyssus.

Subgenus Pterynotus, s.s. has back of varices roughened, varices winged.

Subgenus Pteropurpura Jousseaume,1880. Type (orig. desig.), Murex macropterus Deshayes. Varices smooth except on the face, winged. Californian species : Pterynotus (Pteropurpura) carpenteri; P. (P.) tremperi; P. (P.) trialatus.

Subgenus Jaton Pusch,1837. Type (fide Sherborn) Murex decussatus Linne. Varices rolled backward. Californian species: Pterynotus (Jaton) festivus (Hinds); P.(J) gemma (Sowerby);(?); P. (J.) santarosanus (Dall) (?); P. (J.) incisus (Broderip) (?) from Panamic province.

(Note that these last three allocations are with doubt; I suspect that a new subgenus must be proposed but hesitate to name one until exhaust--ing all the possibilities in the literature.)

Genus Purpura Martyn,1784. Type (monotypy), P. foliata Martyn - Murex foliatus Gmelin,1790.

Trivaricate, with a large apertural tooth. Californian species: P. foliata and P. nuttallii (Conrad).

Genus Pterynotus Swainson,1833. Type (monotypy), Murex pinnatus Wood. " Trivaricate, varices not spiny" (Keen).

" Shells in this subgenus are usually about three inches or less in size, have three wing or blade-like varices which are generally laminated and have the spines very much reduced or absent. The siphonal canal is moderately long and usually quite narrow.

Swainson proposed and described the subgenus Pterynotus in the Zoological Illustrations without a type designation. Later in the same volume,he changed the spelling to Pteronotus and figured M. pinnatus Swainson as its type. The name Pterynotus, however, will have to be used for this subgenus, not only because it has page precedence, but because the later name, Pteronotus, is a homonym." Clench and Farfante,Johnsonia,17:35,36.

Pterynotus petri (Dall),1900. (P. rhyssus (Dall) in synonymy). Monterey, Calif. (?) to Ballenas Lagoon, Lower Calif.

Dr. A. Myra Keen advises regarding the type locality as follows " Our concept of the species rhyssa and petri must be based upon the respective holotypes. These are figured by Oldroyd; the holotype of rhyssa on pl. 30, fig.1, of petri in Pt. II, pl.28, fig.7. The type locality of the latter according to the holotype label is Santa Barbara, 61 fms., mud."

This species has been a problem or rather its relationship to rhyssa. Dr. Dall described petri in Nautilus 14, p.37 with no figure. Later in Proc. U.S.N.M., vol. 24, p. 532 (a brief note that does not seem to agree with his original description) and figures it on pl.34, fig.7, 1902. In 1919 Dall in Proc. U.S.N.M., vol.56, p.332 described rhyssa (no figure) but the description is perfect for the common deep water southern California species with the rasp-like surface. To add to the confusion Dr. Dall in Bull. 112 placed petri and rhyssa in different subgenera, a practice that seems absurd to all students of this group. Mr. George Willett commented " I am sure that I have seen intergrades and doubt if rhyssa is distinct from petri." Mr. Allyn G. Smith (Per. Comm.) states " According to Mackenzie

Gordon, who looked at the types of petri and rhyssus, these two species are synonymous, petri having precedence. This is your common dredged form off Redondo. I have not seen anything like it from Monterey and doubt if it lives here." " The common small Alipurpura from the shale in Monterey Bay is certainly not rhyssa, but carpenteri. I think you are right in assuming that Dall was confused, the net result being that there is a bad mess for someone to straighten out. Heres what I think, for whatever it may be worth.

1. Murex carpenteri was based on types from Monterey Bay, furnished by F.L. Button. This is the common form from the shale bed. Described in 1899.

2. In 1900, Dall described M. petri from " San Pedro, in deep water ."

3. In 1902, he figured both species (supposedly) in the USNM proceedings , his plate being republished by Mrs. Oldroyd (v.2, pt.1, pl.28). This was his first error, as the shell figured as carpenteri is definitely not the Monterey species but based on a southern California shell.

4. In 1919 he described Murex rhyssus from San Pedro based on shells furnished by Mrs. Oldroyd.

5. In 1911, Hemphill described M. carpenteri tremperi from " Newport Bay and San Pedro, in 35 fathoms", based on a banded color form of the southern California species.

6. Assuming true carpenteri is not found south of Point Conception, which I suspect is the case, then the large southern California species is left without a name. Fortunately a name is available and is the one used by Hemphill. So I propose this be used- Murex tremperi Hemphill, of which the types are in the C.A.S. Paleo. Type Collection. Hemphill figured his species in the Transactions of the San Diego Society and Dall's figure of Carpenteri (Oldroyd, pl.28, fig.9) illustrates another variation of tremperi, probably the smoothish brown form from San Diego.

7. Dall's figure of petri is correct (Oldroyd, pl.28, fig.7) and Mrs. Oldroyd's figure of rhyssus (pl. 30, fig.1) is M. petri.

Collecting data; for P. petri (Dall)- Very abundant off Redondo Beach, Calif. in 25 fathoms on gravel botton, less common in deeper water down to 75 fathoms; common in the dredging off Santa Monica, Calif., Dan pt. Calif. and also in Todos Santos Bay in 20 to 35 fathoms (Burch); Redondo Beach(Baker and Chaney); San Pedro, Calif. in 20 fms. (Lowe); Newport in 25 fms. (Lowe); Point Loma Lighthouse (Chaney); Coronado, Calif. in kelp holdfast (Bristol)

Pterynotus erinaceoides (Valenciennes), 1832. San Diego, Calif. to Panama. Type locality, Acapulco, Mexico.

The San Diego record for this species is definitely questionable. It is a species of the southern fauna and no member of the club reports having seen or heard of the species from San Diego.

Collecting data: Magdalena Bay, L.C.; Conception Bay; Punta Penasco, Sonora, Mexico; Guaymas, Mexico; Kino Bay, Mex. (H.N. Lowe); San Ignacio Lagoon, L.C. (Hemphill).

Subgenus Pteropurpura Jousseaume, 1880. Type (by original designation) Murex macropterus Deshayes.

" Varices smooth except on the face, winged " (Keen).

" Shells generally under two and one-half inches in length and possessing three varices. The varices are webbed , blade-like and composed of numerous laminae. The siphonal canal is closed on the ventral side and not slit-like as in other subgenera. The canal becomes a tube which opens at the base of the aperture. Operculum unguiculate, with an apical nucleus." Johnsonia #17, p. 39.

Pterynotus (Pteropurpura) carpenteri (Dall), 1899. Farallones Islands to Point Conception. Type locality, Monterey, Calif.

This species was discussed under P. petri and subject to correction we are accepting the diagnosis of Mr. A.G. Smith. The differences between the large southern California shells with the curved wings and those from off Monterey, Calif. the type locality of carpenteri, have often been noted by collectors. If theyare not distinct species they are at least subspecifically different.

Collecting data: Very common on the shale off Del Monte, Monterey, Calif. On our last trip to Monterey we picked up over 300 living specimens in two days dredging. (Burch).

Monterey

Pterynotus (Pteropurpura) tremperi (Hemphill), 1911. Point Conception to San Diego. Type locality, Santa Barbara channel off Newport, Calif.

This species is discussed under petri and also carpenteri. Hemphill described this species as a color variety of carpenteri. The white bands and other white markings are of no significance and appear frequently in this species as wellas in those from off Monterey. However, Hemphill did figure the southern California species and his description is adequate. therefore his specific name tremperi may be used ignoring the reference to the white color bands.

Mr. A.G. Smith makes an interesting comment on this species also " M. tremperi is found occasionally in Monterey but is scarce. You and I dredged one in 40 fms. several years ago, if you remember. I dredged others in prior years and I think Mackenzie Gordon has a few specimens from the Bay also. We do not believe that tremperi and carpenteri, as found in the Bay, are the same, although it is true we have not seen any authentic young specimens of tremperi from there."

Collecting data: Redondo Beach, Calif. in 50 fms. rocky (Burch); Catalina Island in 30 fms. (G. Willett); Catalina Island in 30 fms.(Lowe); Redondo Beach in 65 fms. (Lowe); San Pedro, Calif. (Lowe); Newport Calif. in 35 fms. (Lowe).

Pterynotus (Pteropurpura) trialatus (Sowerby), 1841. Bodega Bay, Calif. south to lat. 27 (Keen). Type locality not known.

Collecting data: There are many color variations in this species. Pure white specimens are not uncommon with the brown bands appearing in many arrangements. It is not one of our common species but all collectors pick up a few of them. The habitat is rocky rubble although they are occasionally picked up in estuaries spawning. We have taken them from Mission Bay. Perhaps the finest individual specimens in our collection came from the Santa Monica breakwater. This may be due to the fact that this breakwater is not accessible except by boat and is somewhat protected for that reason. A favorite locality has been the rocks along the landward shore of Newport Bay; somewhat less common on the outside at Corona del Mar. We have taken some nice specimens from the Balboa breakwater. The species has always seemed to be exceedingly abundant in the rubble at San Onofre, Calif. but without a doubt the locality where they have been the most abundant in our experience was Punta Banda, on Todos Santos Bay. On our last visit to Punta Banda there were ten or more in the party and we must have taken an average of better than 100 living specimens each. Here the idea is to search the crevices between the large rocks. This seems to be a littoral species. We have never dredged it at any depth.(Burch); La Jolla (Wilson); Mission Bay (Beckwith and Wilson); San Diego (Baker); Todos Santos Bay, L.C. (Hemphill); Punta Banda, L.C. (Lowe); San Pedro (Lowe); Mission Bay (Bristol); white variety-San Pedro (Lowe).

" I doubt the Bodega Bay record. Not found in Monterey Bay" (A.G. Smith)

Subgenus *Jaton* Pusch,1837. Type (fide Sherborn), *Murex decussatus* Linnaeus. "Varices rolled backward" (Keen).

" Shell like that of the typical subgenus but with the three lamellar projections much reduced, either entirely absent or merely low shields next to the low, rounded varices, another set of varices without the lamellar shields alternating with the originals and practically as strong." Grant and Gale, 1931, p.707. Grant and Gale used the genus *Purpura* to include the entire group.

Pterynotus (Jaton) festivus (Hinds),1843. Santa Barbara, Calif. to San Ignacio Lagoon, L.C. (Jordan). Type locality, Magdalena Bay, Lower Calif .

Collecting data: This is perhaps the most common species of the family and easily found in almost all rocky localities. The largest and finest specimens in our collection though were taken on the mud flats spawning in June in Mugu Bay, Ventura Co., Calif. They were very abundant and many of them with *Crepidula onyx* attached to them. We have seen them literally by the thousands on the mud flats of Mission Bay also. There are a few odd notes regarding the species in our cards. We took young specimens in great numbers on the backs of the large spider crab, *Loxorhynchus grandis* off Redondo Beach. These specimens seemed to all be of a deep red color. The bathymetric range is somewhat amazing also. The species is quite common on down to below 25 fms. and we have brought them up living from as deep as 75 fms. (Burch); La Jolla (Chaney); Ballast Point from deep water (Sefton); Mission Bay abundant in 1935 on pilings (Bristol); San Diego Bay (Hemphill and Baker); San Pedro (Lowe); Todos Santos Bay (Orcutt); San Quintin Bay (Orcutt).

Pterynotus (Jaton) gemma (Sowerby),1879. Santa Barbara, Calif. to San Hipolito, L.C. (Jordan). Type locality not known.

Collecting data: Our experience has been to find this a common species all along the rocky localities of southern California. We have found it common along the Palos Verdes from Point Firmin north to Malaga Cove; fine specimens at Dana Point. An interesting note on the Dana Point specimens is that the rocks are incrusted with thick layers of worm tubes incrusting the rocks and creating hollows under them. By knocking off these worm tubes with a heavy rod or hammer the *gemma* will scatter about. And being protected they are likely to be perfect specimens with spines and curled apertures. San Onofre, Calif. in the rubble reef is a good place to find them in great numbers. Also Punta Banda on Todos Santos Bay, L.C. (Burch); Cedros Island, L.C. (Lowe); San Diego (Baker and Stephens); La Jolla (Bristol); Laguna Beach (Lowe); Catalina Island in 30 fms. (Lowe); San Pedro (Oldroyd).

Pterynotus (Jaton) santarosanus (Dall),1905. Santa Barbara Islands, Calif. to Cerros Island, L.C. Type locality, off Santa Rosa Island,Calif. in 82 fms.

Collecting data: This species bears a superficial resemblance to *gemma* but is quite distinct on examination. It is interesting that the two species seem to intergrade or whatever paleontologists call it in *M. eldridgei* Arnold. I may be mistaken about this but at least I have been unable to arrange my fossils to satisfactorily separate these two species as I can do with my Recent shells.

Our experience has been to find this species comparatively rare. We have dredged it in 25 fms. off Redondo Beach on gravel bottom, off Santa Cruz Island, and in Todos Santos Bay in 20 fms. Always on gravel or rocky bottom. Mr. and Mrs. Ralph Bormann collected a fine set of them at White's

Point, Los Angeles Co., Calif. in littoral collecting. All of their shells were hermit crab specimens but in good shape. (Burch); So. Island, Los Coronados in 10-14 fms. (Baker); San Pedro in 15 fms. (Lowe); Catalina Island in 30 fms. (Lowe); Catalina Island in 30 fms. and San Pedro in 15 fms. (G. Willett).

The following keys from the notebook of Mr. A.M. Strong will be of interest.

Family Muricidae- Key to Genera

Shell varicose or with axial ribs
. Whorls with a small open tube between the varices .... Typhis
. Whorls without tubes
.. Whorls with 2 strongly developed lateral varices
... Intermediate varices absent .... Aspella
... Intermediate varices present ....Eupleura
.. Whorls with 3 equal varices
... Outer lip with an anterior tooth or horn ....Purpura
... Outer lip without a horn ....Murex
.... Shell club shaped, with a long, narrow canal ....(Murex)
.... Shell triangular to ovate, canal short
..... Varices with erect, waved digitations .... (Pteropurpura)
..... Varices frondose .... (?)
..... Varices expanded, with points or spines ....(Alipurpura)
..... Varices flatly reflected ....(?)
.. Whorls with 5 or more varices or axial ribs
...Outer lip with an anterior tooth or horn
....Varices distinct
..... Canal open ....Forreria
..... Canal closed .... (?)
.... Varices more or less obsolete .... Chorus
... Outer lip without an anterior tooth
.... Canal more or less completely roofed over
..... Shell pyriform, sutures deeply pitted .... Eriremis
..... Shell globose, large, canal short ....Phyllonotus
..... Shell ovate, canal rather long .... Homalacantha
..... Shell elongate ovate, canal short
...... Surface imbricated .... Muricopsis
...... Surface not imbricated .... Vitularia
..... Shell fusiform, lip thickened and dentate .... Tritonalia
.... Canal wide, open .... Trophon

Keys to species of Typhis,Aspella,Eupleura

Whorls with a small, open tube between the varices .... Typhis

. Varices with a spine at the shoulder
.. Shell broad, with a short canal
30 mm. Lower California .... latipennis
Proc. USNM, vol. 56, p. 389
.. Shell slender, with a long canal
27 mm. Gulf of California .... martyria
Proc. USNM, vol. 24, p. 560
. Varices hooked at the shoulder
.. Canal narrow, recurved at the end
20 mm. Panama to Ecuador .... quadratus
Reeve, vol.3, p.13; Tryon, vol.2, p. 157

.. Canal straight, truncated at the end
Ecuador .... coronatus
Reeve, vol.1, p.2; Tryon, page 137, v.2
.Varices rounded at the shoulder
.. Canal very long and slender ? spined
25 mm. Venezuela .... cumingii
Reeve, p.4, vol.1; Tryon, p.137, v.2.
.. Canal broad, rather short
... Varices fluted
Gulf of California .... pinnatus
Reeve, v.2,p.7; v.1, p.3; Tryon, v.2, p.138
... Varices lamellar
35 mm. Gulf of California .... grandis
Reeve, v.1, p.1; Tryon, v.2, p.138

Whorls with 2 strongly developed lateral varices
. Intermediate varices absent .... Aspella
.. Whorls smooth, crowned with small raised plates
25 mm. Acapulco to Panama .... pyramidalis
Reeve, Ranella, vol.8, p.43; Tryon, v.3, p.44.
.. Whorls with narrow, close-set, spiral ridges
Nicaragua to Panama .... erosus
Reeve, Murex, v.22, p.160; Tryon,v.2, p.129.

Whorls with 2 strongly developed lateral varices
. Intermediate varices present .... Eupleura
.. Varices broad, not spined
30 mm. Cerros Island to Venezuela .... muriciformis
Reeve, Ranella, v.7, p.34; Tryon, v.2, p.158
.. Varices with 5 spinose points, canal long
Gulf of California .... pectinata
Reeve, Ranella, v.7, p.35.
.. Varices with 7 prickly spines, canal short
30 mm. Panama to Ecuador .... nitida
Reevo, Ranella, v.8, p.45; Tryon, v.2, p.158.
.. Varices reduced to nodules on angle of whorls
21.5 mm. Off San Diego .... grippi
Oldroyd, v.2, part 2, p.28.

Genus Typhis Montfort,1810.

Typhis coronatus Broderip,1832.	Venezuela to Ecuador
Typhis cumingii Broderip,1832.	Venezuela
Typhis fimbriatus A. Adams,1853.	Gulf of California
Typhis grandis A. Adams,1854.	Gulf of California
Typhis latipennis Dall,1919.	Lower California
Typhis lowei Pilsbry.	Montijo Bay to Panama.
Typhis martyria Dall.	Gulf of California
Typhis pinnatus Broderip.	Gulf of California
Typhis quadratus Hinds,1843.	Panama to Ecuador

Genus Aspella Morch,1877

Aspella erosus Broderip,1832.	Nicaragua to Galapagos
Aspella obeliscus A. Adams.	Gulf of California to Panama

Genus Eupleura H. & A. Adams,1853

Eupleura grippi Dall,1911.	San Diego
Eupleura muriciformis Broderip,1832.	Cerros Island to Venezuela
Eupleura nitida Broderip,1832.	Panama and Ecuador

Whorls with 3 equal varices
. Outer lip with an anterior tooth or horn .... Purpura
.. Surface between varices nearly smooth
75 mm. Sitka to San Diego .... foliata
Oldroyd, vol.2, pt.2, page 14.
.. Surface spirally ribbed over a rounded node
65 mm. Monterey to Scammon's Lagoon....... nuttalli
Oldroyd, vol.2, part 2, p.14
.. Surface tuberculately spirally ribbed
35 mm. Lower California .... monoceros
Reeve, Murex, vol.2,p.7; Tryon, v.2, p.115.
.. Surface with a solid, prominent tubercle
40 mm. Ecuador .... pinnigera
Reeve, Murex, v.16,p.62; Tryon, v.2, p.112.

Whorls with 3 equal varices
. Outer lip without a horn .... Murex
.. Shell club shaped, with a long, narrow canal ....(Murex)
... Canal without spines
75 mm. Gulf of Calif. to Peru .... elenensis
equals plicatus Reeve, v.21, p.87; Tryon, v.2, p.80.
... Canal with spines
.... Varices cut into spined tubercles
50 mm. Gulf of California to Ecuador .... recurvirostris
Reeve, v.19, p.75; Tryon, v.2, p.80.
.... Varices rounded, with a single short spine
Lower California to Panama .... rectirostris
Reeve, v.22, p.91

.. Shell fusiform to triangular, canal short
... Varices with erect, waved digitations .... (Pteropurpura)
.... Spiral sculpture present
65 mm. Santa Barbara to San Pedro .... petri
Oldroyd, v.2, pt.2, page 12
.... Spiral s culpture absent
60 mm. Point Conception to San Diego .... carpenteri
Oldroyd, v.2, pt.2, page 10
... Varices frondose .... (?)
.... Fronds branching Gulf of California ..... palma rosus mexicanus

... Varices with narrow digitations or spines ....(Alipurpura)
.... Spiral sculpture present
..... Spiral ridged alternating in size
60 mm. Santa Barbara to Ballenas Lagoon .... rhyssus
Oldroyd, v.2, pt.2, p.9.
..... Spiral ridges equal San Diego to Panama .... erinaceoides
Oldroyd,v.2, pt.2, p.9. equals californica Reeve,v.30,p.144;
Tryon, v.2, p.113.
.... Spiral sculpture absent
..... Varices expanded to flat spines at the shoulder
75 mm. Bodega Bay to Todos Santos Bay .... trialatus
Oldroyd, v.2, pt.2, p.10.
..... Varices with a single rounded spine at the shoulder
55 mm. Cerros Island .... leeanus
Proc. USNM, v.12, p.329.
..... Varices with 3 additional spines
45 mm. Central America .... centrifugus
Reeve,v.28, p.130; Tryon, v.2, p.113.

Whorls with 3 equal varices
. Outer lip without a horn
.. Shell triangular to ovate, canal short .... Murex
... Varices flatly reflected ....(?)
.... Varices frilled, spiral sculpture obsolete
45 mm. Santa Barbara to Magdalena Bay...... festivus
Oldroyd, v.2, pt.2, p.13.

Whorls with 5 or more varices
. Outer lip with an anterior tooth or horn
.. Varices distinct
... Canal open ....Forreria
.... Varices spined at the shoulder of the whorls
150 mm. San Pedro to Scammons Lagoon .... belcheri
Oldroyd, v.2, pt.2, p.49
... Canal closed .... (?)
.... Varices raised into short, lamellar spines
40 mm. Peru .... fontainei
Tryon, v.2, p.126
.. Varices more or less obsolete .... Chorus
... Whorls swollen in the middle
100 mm. Chile .... giganteus
Reeve, Monoceras, v.1, p.3; Tryon, v.2, p.194.

Whorls with 5 or more varices
. Outer lip without an anterior horn
.. Canal more or less completely roofed over
... Shell pyriform, sutures deeply pitted,.............. Triremis-- Jaton
.... Varices thick, smooth, crossed by raised ridges
30 mm. Santa Barbara to Cerros Island .... gemmis
Oldroyd, v.2, pt.2, p.13
.... Varices low, thin, a curved spine at the suture
45 mm. Santa Barbara to Cerros Island .... santarosanus
Oldroyd, v.2, pt.2, p.12
.... Varices with 9 or 10 recurved spines
50 mm. Acapulco to Ecuador .... stearnsii
Nautilus, v.32, p.26.
.... Varices with a double row or recurved spines
35 mm. Magdalena Bay to Ecuador .... humilis
Reeve, Murex, v.13, p.50; Tryon, v.2, p.103.
.... Varices with alternating, erect spines
55 mm. Central America .... oxyacantha
Reeve, Murex, v.4, p.17
.... Varices digitated, wings at the suture
35 mm. Gulf of California .... fimbriatus
Tryon, v.2, p.103
.... Varices frondose, palmated at the shoulder
Acapulco to Peru .... varicosus
Tryon, v.2, p.199; Proc. USNM, v.37, p.219

Whorls with 5 or more varices
. Outer lip without an anterior tooth
.. Canal more or less completely roofed over
... Shell globose, large, canal short .... Phyllonotus
.... Spiral sculpture of fine, equal striae
..... Varices 5, short, recurved Galapagos .... pumilis
125 mm. Tryon, v.2, p.135

..... Varices 6-9, with pointed knobs on the shoulder
150 mm. Gulf of California to Peru .... bicolor
Reeve, Murex, v.11, p.44; Tryon, v.2, p.101.

..... Varices 6-8, with a double row of spines
125 mm. Gulf of California to Peru .... regius
Black on aperture. Reeve, Murex, v.15, p.59; Tryon, v.2, p.100

..... Varices 6-8, each with 3 fronds
135 mm. Gulf of California to Panama................. princeps
Reeve, Murex, v.6, p.24; Tryon, v.2, p. 106.

.... Spiral sculpture of unequal ridges

..... Varices 6-9, armed with ample fronds
175 mm. Gulf of Calif. to Acapulco.................. nigritus
Reeve, Murex, v.13, p.51.

..... Varices 10-15, armed with many fronds
125 mm. Acapulco to Peru .... radix
Reeve, Murex, p.69, vol.17; Tryon, v.2, p.219.

..... Varices 10, armed with compressed scales
50 mm. Peru .... tortuosus
equals crispus Reeve, Murex, v.17, p.67.

.... Spiral sculpture of broad, flat ridges

..... Varices 8-13, with fronds alternating in size
175 mm. Magdalena Bay to Acapulco .... nitidus
Reeve, Murex, v.17, p.70; Tryon, v.2, p.105

.... Spiral sculpture of nodulous ridges

..... Varices 6-8, flat, denticulated
175 mm. Gulf of California to Peru .... brassica
Reeve, Murex, v.14, p.56; Tryon v.2, p.100

.... Spiral sculpture of carinate ridges

..... Varices 7, rounded thick Ecuador .... incisus
Reeve, Murex, v.31, p.155

... Shell ovate, canal rather long .... Homalacanthina

.... Varices 6, frondose, spiral ridges strong
Panama Bay........................ norrisii
Reeve, Murex, v.28, p.129

... Shell elongate, ovate, canal short

.... Surface imbricated ....Muricopsis

..... Varices 7, indistinct, spiral ridges few
15 mm. Gulf of California .... pauxillus
Tryon, v.2, p.109; Maz. Cat. # 676

..... Varices 7, tuberculate, spiral striae numerous
25 mm. Gulf of California to Panama .... dubia
Reeve, Murex, 26-116; Tryon 2-109

...... Sculpture more delicate
Lower California to Panama .... squamulata
Tryon 2-109

.... Surface not imbricated .... Vitularia

..... Varices broad, armed with short spines
20 mm. Acapulco to Peru .... vittata
Reeve, Murex, 29-140; Tryon 2-110.

..... Varices more or less obsolete, nodose at shoulder
90 mm. Cerros Island to Panama .... salebrosa
Reeve, Murex, 24-98; Tryon, 2-133.

The following list of species as arranged in Mr. A.M. Strong's notebook will be of interest for comparison since we did not follow it in all particulars.

Genus Murex Linnaeus,1758.
Murex elenensis Dall,1909 (plicatus Sby.) Gulf of California to Peru
Murex nigrescens Sowerby,1841. Gulf of California to Ecuador
Records of M. recurvirostris Broderip, a West Indian species belong here.
Murex rectirostris Sowerby,1840. Scammons Lagoon to Panama
Genus Alipurpura Bayle,1884.
Alipurpura erinaceoides(Valenciennes)1832. San Diego to Panama.
Alipurpura rhyssa(Dall)1919. Santa Barbara to Ballenas Lagoon
Alipurpura trialata(Sowerby)1841 Bodega Bay to Todos Santos Bay
Genus Pteropurpura Jousseaume,1880.
Pteropurpura carpenteri (Dall),1889. Monterey to San Pedro
Pteropurpura petri (Dall),1900. Monterey to San Pedro
Genus Jaton Pusch,1837. Triremis Bayle,1884.
Jaton festiva (Hinds),1843. Santa Barbara to Cerros Island
Jaton gemma (Sowerby),1879. Santa Barbara to Cerros Island
All northern records of M. incisa belong here.
Jaton santarosana (Dall),1905. Santa Barbara to Cerros Island
Jaton pinnigera (Broderip),1832. West Columbia to Peru
Genus Centrifuga Grant and Gale,1931.
Centrifuga leeanus (Dall),1899. Guadalupe Island to Cerros Island
Centrifuga centrifuga (Hinds),1843. Panama to West Columbia
Genus Muricopsis
Muricopsis dubia (Sowerby),1835. Gulf of California to Panama
Muricopsis pauxilla (A. Adams), 1853 Gulf of California
Muricopsis squamulata (Carpenter) Lower California to Panama
Genus Vitularia Swainson,1840.
Vitularia salebrosa King Cerros Island to Panama
Genus Chicoreus Montfort,1810.
Chicoreus palmarosa mexicana (Stearns),1893. Gulf of California
Genus Homalacanthina Morch,1852.
Homalacanthina norrisii (Reeve) Bay of Panama
Homalacanthina varicosa (Sowerby),1835. Acapulco to Peru
Genus Phyllonotus Swainson,1840.
Phyllonotus brassicus(Lamarck),1822 Gulf of Calif. to Peru
Phyllonotus dipsacus (Broderip),1832 Ecuador
Phyllonotus hippocastanum (Philippi) (bicolor Val.) Gulf of Calif. to Panama
Phyllonotus nigrites (Philippi),1845. Gulf of Calif. to Acapulco
Phyllonotus nitidus (Broderip),1832. Magdalena Bay to Acapulco
Genus Chorus Gray,1847
Chorus giganteus Lamarck Chile
Genus Purpura Martyn,1784.
Purpura foliata Martyn,1784. Alaska to San Diego.
Purpura fontainei Tryon,1880 Peru
Purpura monoceros Sowerby,1840. Lower California
Purpura nuttallii Conrad,1837. Monterey to Scammons Lagoon

Genus Purpura Martyn,1784. Type (by monotypy), Purpura foliata Martyn.

" Shell triangular, varices wing-like; aperture elongate-ovate. Canal moderately long, usually closed in adult specimens; outer lip with a produced tooth near the base." (Tryon, Manual of Conchology).

This is the description of the subgenus Cerostoma (Conrad). Purpura Martyn is the first binomial use of the name, used by the ancients colloquially to indicate the muricoid shells from which the Tyrian purple was derived. In harmony with this tradition it is applied by Martyn to a shell which Linnaeus would have called Murex ,and which has been usually known as Cerostoma foliatum Martyn, after Carpenter. This is Martyn's only species of Purpura in Volumes I and II, and hence the type. In 1798 Bolten adopted the same view,and began his list of Purpuras with the group of Murex trunculus. There seems to be no doubt that, if any of Martyn's names are valid, Purpura foliata must typify the group bearing the ancient designation" (Dall).

This was discussed under the first part of this paper and we have on several occasions taken up the matter of the Martyn names. For the present, at least, we are using the Martyn names where they seem to be valid. Grant and Gale expanded the use of Purpura to incluse the entire group. We are not following them in this. Mr. A.M. Strong's key to the species will be found at the top of page 39.

Purpura foliata Martyn,1784. Sitka, Alaska to San Diego, Calif. Type locality, Northwest Coast of America.

"I doubt the San Diego record, and suspect it does not live farther south than Pt. Conception" (A.G. Smith). However, Mr. George Willett reports having collected the species off San Pedro in 20 fms. H.N. Lowe also reported it from off San Pedro in 35 fathoms. Therefore, it is quite possible that specimens have been taken as far south as San Diego.

Collecting data: Our experience has been to collect fine specimens in abundance at Port Orchard, Puget Sound, Washington; the breakwater at Crescent City, Calif.; De Poe Bay, Oregon; Port Orford, Oregon; large specimens dredged off Monterey, Calif. on the shale in about 20 fms.; Spooner's Beach, 6 miles south of Morro Bay, Calif. (Burch); Southeast Alaska north to Sitka (G. Willett); Port Orchard, Kitsap Co.,Wash. and Craig, Prince of Wales Id., Alaska- on rocks at low tide (W.J. Eyerdam); Drakes Bay, Calif. (Arnheim); Point San Luis, Calif. (Cook and Lowe); San Juan Islands, Puget Sound in 20 fms. (Oldroyd); Sitka and Ketchikan, Alaska (Lowe).

Purpura nuttalli (Conrad),1837. Monterey, Calif. (?) to Magdalena Bay, L.C. (Grant and Gale). Type locality, Santa Barbara, Calif.

" The Monterey record is undoubtedly an error. Has anyone taken it north of Pt. Conception ? Would place albescens and albofasciata in synonymy." (A.G. Smith).

" The outer margin of the last two varices on adult specimens flares backward but is not frilled as in foliata. The spiral cords are fewer and much less pronounced than in foliata." (Grant and Gale, p.705).

Dr. Dall named two color forms of this species, albescens (white) and albofasciata (brown with a white band in the middle). Almost every immaginable variation of brown and white may be selected from these shells and the consensus of opinion is that they are of no significance and are therefore in the synonymy of the typical. There is another subspecies, aciculiger Valenciennes,1846.In this the varices are " thick and rounded" according to the description. Oldroyd figures this, pl.30, figs. 12,12a,12b. (con).

The figures remind one of the common form or at best a race affected by the habitat. Mr. A.G. Smith and the majority are disposed to place this also in the synonymy of the typical.

Collecting data: This is one of the very common species in southern California. It not only frequents almost every rubble locality but is very abundant on wharf piles and far up in the estuaries it is common on floats, bridge pilings etc. It must be littoral or very shallow water species because we have never picked it up in dredgings at any depth. A list of collecting localities would cover the coast of southern Calif. (Burch); Mission Bay and La Jolla (Bristol); Cedros Island, L.C. (Lowe); San Pedro and White's Point (Lowe).

*** Note- We have the following comment on the generic name from Dr. W.P. Woodring (Per. Comm. July,1945):

" Purpura" Martyn. " If Martyn's names are rejected, as I think they should be, the genus is Pteroytis Conrad,1862 (monotypic), Murex umbrifer Conrad, Miocene, Virginia."

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Genus Ocenebra Gray,1847. Type (by original designation), Murex erinaceus Linne. Tritonalia of Dall, Oldroyd and authors in synonymy.

Dr. A. Myra Keen states (Per. Comm. July,1945) " The last time Dr. Berry was here we went over the question of Tritonalia vs. Ocenebra and I reluctantly became convinced that we must adopt the latter. Tritonalia was proposed by Fleming as a substitute for Triton, which he discovered to be preoccupied, and, since he designated no type, must take the same genotype; namely , Triton tritonis Linne. The fact that Fleming grouped a number of species including erinaceus under his concept of Triton does not make any of them available for subsequent designation as Dall supposed. Therefore, the next available name for the erinaceus group is Ocenebra Gray,1847, type (by original designation), Murex erinaceus Linne. Incidentally, this interpretation will make Tritonalia available for the group of Indo-Pacific and Carribbean species now placed under Charonia."

Mr. A.G. Smith writes (Per. Comm. July,1945) " We are using Ocenebra based on Winckworth, Names of British Mollusca- II- Jour. Conch. 20(1): 9-15, 1934. "

" Shell generally small, purpuriform, with many varices, which may be foliated or spinose; spiral sculpture generally present; anterior canal partly or nearly closed." (Grant & Gale).

Ocenebra gracillima Stearns,1871. Monterey to Gulf of California. Type locality, San Diego, Calif.

This is a very common small species in rocky rubble all along the coast of southern California. It is also a common species in wharf pilings and in such places as the bridge pilings in Anaheim and Newport Bays. It is too common to list collecting localities.

The variety obesa (Stearns MS) Dall,1919 , type locality Laguna Beach, Calif. is generally placed in the synonymy of the typical and considered of no significance. It is described as ' wider'. The described measurements are for gracillima, length .50; width .25 in. and for obesa height of shell 19, of aperture and canal 8, diameter 7.5 mm. Shells to fit either of these may easily be selected from any large set of the species. (Burch).

Mr. A.G. Smith advises on this species " Type lot from San Diego, collected by Hemphill. Part of the original lot is in the C.A.S., labelled " cotypes" by Hemphill. I have a lot of 2 specimens from Santa Barbara, and another sizable lot from Avalon, Catalina Island, in addition to others from southern California. Would put obesa in synonymy".

Ocenebra stearnsi Hemphill,1911. Type locality, Monterey, Calif.

In the preliminary discussions the following comments were made by John Q. Burch. This species has been something of a puzzle to many of us. We have shells from Monterey that fit the description perfectly " dark yellow or brownish, plain or with a single white revolving band at the periphery of the body whorl", but this color pattern may be selected from almost any large set of gracillima the length of the coast. Hemphill stresses the " pitted sculpturing" as distinguished from gracillima in his note following the description (not copied in Oldroyd), but I cannot see this because my gracillima also seems to my eye to be pitted.

The following note from Mr. A.G. Smith confirms the above suspicion, " O. stearnsi Hemphill - Type locality, Monterey; types (2 specimens) in C.A.S. Two additional lots of 2 specimens each also in the C.A.S. My own collection has three lots of 1,2, and 3 specimens, respectively, which I collected at Pacific Grove and Point Pinos. This species is nothing more or less than O. gracillima and should go into the synonymy of this species. The Monterey shells are lighter in color, more tumid, and with somewhat rougher sculpture than the typical shells from San Diego. It so happened that the shells Hemphill picked out as types have a white line encircling the middle of the last whorl but his other shells from Monterey do not have this white line and none of mine has either. I suspect that all records of gracillima from Monterey are the weakly-differentiated variant Hemphill named as stearnsi. Until I checked the types the other day I thought stearnsi was something entirely different."

Dr. A. M. Keen reports " Two paratypes of the Ocenebra stearnsi Hemphill are in the Stanford type collection."

Ocenebra lurida (Middendorff),1849. Forrester Island, to Catalina Island. Type locality, Sitka, Alaska.

Collecting data: Our experience has been to find this species very common and very variable. We have never seen it from southern California. Our records: Crescent City, Calif.; Monterey in 10-20 fms.; Cayucos, Calif. littoral. However, there seems to be a definite question about these records being for the typical lurida as found at Sitka, Alaska. (Burch). Mr. A.G. Smith states " I have no real lurida and have seen no specimens from Sitka, the type locality. If you know of anyone who has Alaskan lurida to spare, I should much like to have one or more for comparative purposes. Does anyone know just how far down the Pacific Coast lurida (typical) comes?"

Mr. George Willett of the Los Angeles Museum who has collected and studies this species extensively reports as follows : Craig and Ketchikan Alaska (shore); Santa Cruz Island in 10 fms.; Catalina Island in 30 fms. .

W.J. Eyerdam reports: Port Ludlow, Kitsap Co., Wash.; Ishut Bay, Afognak Island, and Drier Bay, Knight Island, Alaska -under stones and rock at lowest tide marks."

Ocenebra lurida aspera (Baird),1863. Sitka, Alaska to San Pedro, Calif. Type locality, Esquimalt Harbor, Vancouver, B.C.

Collecting data: Off Monterey, Calif. in 10 and 20 fms.; Cayucos, Calif. (littoral); Avila, Calif. (littoral) (Burch); would call it a good subspecies. Common at low tide under rocks at Monterey and vicinity, where yellow, light brown, and bright reddish-brown forms predominate. Along the Mendocino Co. coast the color forms most often found are yellow and purplish black. My experience is that aspera is a littoral species, not taken by dredging"; Forrester Island on shore (G. Willett).

Ocenebra lurida munda Carpenter,1864. Middleton Island, Alaska to San Diego, Calif. Type locality not given.

This was figured in Proc. U.S.N.M. vol.15, pl.20, fig.3,1892. The original description is so short it is insignificant, but there is a very slender form of lurida that we have been labelling munda with a question . Opinions on the validity of this subspecies differ greatly. Our records for what we call munda are: Crescent City, Calif.;San Simeon and Cayucos, Calif.; off Monterey, Calif. in 20 fms. (Burch).

Mr. George Willett is of the opinion that it"equals lurida" But on the other hand Mr. A.G. Smith states " If I am right in what I call munda and I think I am as Mackenzie Gordon checked my material with the types in the USNM, I would almost be inclined to call it a good species. It is a pretty distinct shell, smaller than aspera, but more slender in aspect, like a starved aspera, as Carpenter says in his wholly inadequate description. I have it from shore to 10 fathoms at Monterey and several localities along the Mendocino Co. coast. I have found it to be scarce, whereas aspera is common."

Crescent City, Calif. (Chace); Pacific Grove, very young (Baker).

Ocenebra lurida rotunda (Dall),1919. Moss Beach to San Luis Obispo, Calif. Type locality, Moss Beach, Halfmoon Bay, Calif.

This is another of Dr. Dall's species that have never been figured. Many of us have speculated at times about just what it might be. Mr. A.G. Smith reports " Don't think it is a very good subspecies. I have a set of topotypes, which are not very greatly different from lurida aspera except for the somewhat more tumid body whorl. A single shell from 3 mi. N. of Cayucos (AGS #3310) is similar. Would throw it in with aspera."

Ocenebra squamulifera Gabb,1868. Santa Barbara to San Pedro, Calif. Type locality, Catalina Island. Dr. A. Myra Keen reports " The holotype of Ocenebra squamulifera Gabb is at the University of California.

In the preliminary discussion John Q. Burch stated " There is a very common species off Monterey on the shale in about 20 fms. It is neither foveolata or barbarensis , and we labelled our shells with this name with a question." Mr. A.G. Smith settles the matter as follows " The Monterey shells to which you refer are not squamulifera , I am sure, but a new species, which we have described and are figuring in our Monterey paper. Gabb (Pal. Cal.) says of this species: " The above description (repeated in Oldroyd) and notes were sent to me by Carpenter, in a letter, and were based on a unique fossil specimen found by myself at Santa Barbara, and an immature recent one from Catalina Island, found by Dr. Cooper." From this, I would assume that in all probability the type is the Santa Barbara fossil, probably from the well known " Bath House Beach" (Pleistocene) formation. Specimens from here would therefore be needed to tell just what squamulifera really is. On the basis of existing evidence, my inclination would be to omit it from the Recent fauna."

Mr. A.M. Strong advises on this species " A good series of the Pliocene of Santa Barbara showed foveolata passing into squamulifera and the latter into barbarensis Gabb. Have all those intergrading forms died out since the Pliocene or are none of our series of living shells large enough to show them?"

Mr. George Willett comments " I think the Monterey shells may be O. interfossa beta and that squamulifera is known only as fossil."

There are three specimens so labelled in the Lowe collection in the San Diego Museum and also a specimen from San Diego by Gripp.

Ocenebra fusconotata (Dall),1919. Monterey to Catalina Island, Calif. Type locality, Monterey, Calif.

We have sets of this species from Monterey but have been disposed to consider them foveolata with color bands. The description mentions " six or seven prominent vertical ribs". (Burch). Mr. George Willett comments " Looks like foveolata to me".

Mr. A.G. Smith reports on this species as follows " This species is closely related to O. foveolata. In fact, whether or not it should be considered as a subspecies of foveolata ,or in synonymy with it, depends on the latitude of variation allowed this latter species. It is not a common form at Monterey. We rate it as scarce. Typical specimens with the interrupted dark-brown band on the body whorl are generally dredged. The type, which is 26 mm. long is a very large one; most of our specimens being only about a half inch. Thus, adults average much smaller than foveolata from southern California. Occurance at Monterey: occasional at low tide under rocks and in beach drift; 3-35 fms. on rocksand shale. I have not seen typical fusconotata from other localities. * Would call it a good species until intergrades with foveolata are found. (* except Santa Barbara)."

Ocenebra poulsoni Carpenter,1864 ex Nuttall MS. Santa Barbara, Calif. to Magdalena Bay, L.C. Dr. A. Myra Keen advises on the type locality " The type locality of Ocenebra poulsoni Carpenter,1864 was not given in the original; the expanded description in 1865 implies San Diego."

Collecting data: This is without a doubt the most common species of the genus. It is literally everywhere in great numbers, on breakwaters, rocks, wharf piles, bridge pilings in estuaries etc. It is a shallow water and littoral species, but we have picked it up in our dredgings as deep as 15 fms. (Burch); Magdalena Bay, L.C. (Lowe); Scammons Lagoon, L.C.; San Pedro, Calif. (Lowe); San Diego (Baker, Stephens etc.); Mission Bay (Bristol);

Ocenebra painei (Dall),1903. Dundas Bay, Alaska to San Diego, Calif. Type locality, off Catalina Island, Calif.

Collecting data: off Redondo Beach, Calif. in 75 fathoms, fine gravel and mud (Burch); Catalina Island in 30 fms. (G. Willett); Catalina Island in 50 fms. (Lowe); La Jolla, Calif. in about 100 fms. (A.G. Smith) (1 specimen).

Ocenebra circumtexta (Stearns),1871. Trinidad to Revillagigedo Id. (Strong and Hanna). Type locality, Monterey, Calif.

The variety citrica Dall,1919 is merely the albino form which occurs regularly in all colonies. In my opinion it has no significance.(Burch).

Collecting data: A very abundant species on the rocks at Monterey, San Simeon, Cayucos, Morro Rock, Palos Verdes, Pt. Firmin,Pt. Vicente. Dredged from as deep as 25 fms. off Redondo Beach (Burch); " Have not collected it north of Moss Beach, San Mateo Co. Not dredged in Monterey Bay. The color form citrica has no taxonomic value in my opinion (A.G. Smith) ; Pt. Cayucos, Calif. (Wilcox); 1 mi N. Cambria (Cass); San Miguel Island, Calif. (Hemphill); Whites Point (Orcutt); Catalina Island (Hemphill); No. Id. Los Coronados (Stephens); So. Id. Los Coronados (Baker); San Nicolas Island (Lowe); San Pedro in 30 fms. (Lowe); Port Harford and Monterey, Calif. (Lowe).

Ocenebra interfossa Carpenter,1864. Semidi Islands, Alaska to Pto. Santo Tomas (Jordan). Dr. A.M. Keen advises " The type locality of interfossa according to the holotype label, is Monterey Bay.

This is our common form with the lattice like reticulate sculpture. A number of subspecies have been described.

Collecting data: Monterey, Calif. littoral and dredged down to 20 fms. on the shale off Del Monte; San Simeon and Cayucos; Redondo Beach, Calif in 50 fms.; Dana Point, Calif.; Crescent City, Calif.; De Poe Bay,Oregon (Burch); Prince William Sound, Alaska in 18 fms. (Lewis) (Willett); Southeast Alaska, general, shore (G. Willett); type locality, Monterey; type in USNM. An extremely variable species, both in size and sculpture. Largesta nd finest specimens I have came from Puget Sound. The typical form appears to be littoral and not often dredged, at least at Monterey (A.G. Smith); Point Ludlow,Kitsap Co., Wash.; Izhut Bay,Afognak Id., and Drier Bay, Knight Island, Alaska- same habitat as lurida. (W.J. Eyerdam); San Pedro (Lowe); La Jolla (Bristol); Pt. San Luis(Lowe); Cayucos (Wilcox); Monterey (Hemphill); San Francisco (Lowe); Puget Sound (Lowe).

Ocenebra interfossa fraseri (I. Oldroyd),1920. Vancouver Island, B.C. to Mendocino Co., Calif. Type locality, Departure Bay, Vancouver Island.

Dr. Dall figured but did not describe a subspecies O. interfossa alpha in Bull. 112,pl.13, fig.9. The following statement of Dr. A. Myra Keen disposes of alpha " Specimens in the Stanford collection presumably identified by Dr. Dall are identical with specimens of fraseri Oldroyd. As the latter has priority, we can eliminate " Tritonalia" interfossa alpha as a synonym".

Ocenebra interfossa beta (Carpenter) (Dall),1919. " The range is from Half Moon Bay, San Mateo Co. (Keen) to Imperial Beach, San Diego Co., (Burch. The type locality of "T" beta is Monterey" (Dr. A.M. Keen). Mr. George Willett reports beta from South Coronado Island in 10 fms. taking it father south.

Apparently this variety has never beenfigured. Mr. George Willett is of the opinion that local shells should bear this name. The species we label with this name is a comparatively uncommon, even rare shell taken in our experience largely littoral from Monterey,Portuguese Bend,Imperial Beach,Dana Point and San Onofre. Mr. Willett includes another record from Santa Monica,Calif. by Jay.

A comparison of topotypes of O. i. fraseri from Esquimalt, Vancouver Island, B.C. with the shells we have as beta indicate that these must be very close if not identical. (Burch). However, we certainly collected what we know as beta from Monterey, Calif. and we have the following note from Mr. A.G. Smith " Seems different from interfossa, from the description. Have never collected shells that fit, at Monterey."

It may well be that the above two species should be considered distinct rather than subspecies of interfossa.

*** In the preliminary discussions of the interfossa group the following statement was made by John Q. Burch " My personal opinion is to have O. interfossa and ignore the varieties with the exception of the beta matter. The shells we have been calling beta are far different from those others ." Mr. George Willett comments " I agree heartily". Dr. A. Myra Keen comments " As to the validity of the varieties, I agree with you that there are too many. Specimens in the Stanford collection of clathrata,minor, and atropurpura presumably identified by Dr. Dall are, to my eyes, very similar. The beta and alpha + fraseri seem more distinctive." (con.)

Mr. A.G. Smith made the following comments on the O. fraseri(Oldroyd) -" Have two specimens from the type lot. One is very much like the figure for barbarensis in Bull. 112, pl.6, fig.5, except: (a) it lacks the strong terminal varix; and (b) the canal bends to the left instead of to the right (it also bends to the rear). The other specimen is similar except for the less developed shoulder-points. Fraseri is a heavy-textured shell, whitish in color (dirty white), with a yellowish or yellow-brown throat. It appears to be a good species, possibly related to O. interfossa beta. Oldroyd's figure is terrible."

It might be well to call attention here to the fact that if these species should prove to be identical beta Dall,1919 has priority over fraseri Oldroyd,1920. * see note below.

*** We question the validity of the following three subspecies of interfossa, but will discuss them below.

Ocenebra interfossa clathrata (Stearns) (Dall),1919. Monterey to Catalina Island (Dall). Type locality, Svalon, Catalina Island.

Collecting data: We have specimens from Cayucos,Calif. so labelled and have also dredged the same form off Redondo Beach,Calif.(Burch). Mr. A.G. Smith comments " Short, with tabulate whorls, and extremely clathrate sculpture, showing squarish pits. Have it from the following localities: San Juan Ids., Puget Sound; Little River, Mendocino Co.; shore to 15 fms., Monterey Bay, fairly common; Cayucos. Berry said at one time he thought this was a good species; he may be right."; Cayucos (Lowe); San Diego (Hemphill).

Ocenebra interfossa minor (Dall),1919. Catalina Island,Calif.

This species has never been figured, and the description is very inadequate. Mr. and Mrs. Ralph Bormann collected specimens that seem to fit the description from White's Point, Los Angeles Co., Calif. But the consensus of opinion on it is perhaps well enoggh stated by Mr. A.G. Smith " Don't know it for sure."

Ocenebra interfossa atropurpurea (Carpenter) (Dall),1919. Neah Bay, Wash. to San Diego, Calif. Type locality, Neah Bay, Wash.

Collecting data: I have a set of specimens so labelled collected 3 mi N. of Cayucos,Calif. by Mr. A.G. Smith, but I am unable to separate this from what we call clathrata (Burch). Mr. Smith comments on this as follows: " Thought I had this from Cayucos but now am pretty sure this identification is not correct. Better change the name on the set I gave you to plain interfossa. Topotypes from Neah Bay appear to be needed to tell just what atropurpurea is."

* " As noted above, Ocenebra fraseri (Oldroyd) takes precedence over interfossa alpha Dall. It is probably a good subspecies, representing the extreme development of spiral sculpture and spines on the shoulder of the whorls. Range, Vancouver I. to Pacific Grove,Calif." (Dr. A.M. Keen).

Ocenebra foveolata (Hinds),1843. Moss Beach,San Mateo Co. (Vokes) to Magdalena Bay, L.C. Type locality, Magdalena Bay, L.C.

The original figures in Hinds ' Voyage of the Sulphur' and the species we have been labelling foveolata seem to agree very well. Grant and Gale figured a specimen that looks to be far different. They state that it is a very variable species. The validity of a number of other described forms will depend upon the amount of variation permitted. (con.)

Collecting data: Abundant off Monterey on the shale off Del Monte in 20 to 40 fms.; off Avalon, Catalina Island in 35 fms.; off Redondo Beach, Calif. in 25 fms.; off Dana Point, Orange Co. in 20 fms.(Burch); Redondo Beach, San Pedro, La Jolla, and San Diego (Lowe); there is a specimen in the San Diego Museum of Natural History in the H.N. Lowe collection labelled as from Mazatlan,Mexico which would be an extension of the range southward; Mr. A.G. Smith states " Monterey records doubtful and are probably based on O. fusconotata . Have not seen typical from north of San Pedro."

Ocenebra sclera (Dall),1919. Coast of Washington. Type locality, Port Townsend, Wash. in 20 fms. Dr. Dall gave the range southward to Venice, Calif. but Dr. A. Myra Keen advises as follows " The "T" sclera is not represented in the Stanford collection. I studied the holotype at the National Museum, but have no notes on it other than that the Venice record is incorrect. Apparently it is restricted to the Puget Sound area . The Venice record is of epiphanea." None of our correspondents report having a specimen of this species.

Ocenebra subangulata (Stearns),1873. Orcas Island, Wash. to Gulf of California. (O. michaeli (Ford) in synonymy)

Dr. Dall gave the range of subangulata " Monterey to Santa Barbara Islands" and the above range for michaeli Ford. We have been disposed to consider the two species identical and subangulata has priority.

Type locality: for subangulata , San Miguel Island, Calif. and for michaeli , Cayucos, Calif.

Collecting data: Cayucos,Calif.; San Simeon, Calif.; Monterey,Calif. (Burch); Dr. Keen reports the species taken at Moss Beach, San Mateo Co. by Vokes; Monterey Bay, at low tide to 15 fms. on rocks, rare. Also 3 mi. N. of Fort Ross, Mendocino Co.,one specimen (A.G. Smith); Cayucos and Pt. Reyes (H.N. Lowe).

Ocenebra barbarensis (Gabb),1866. British Columbia to the Santa Barbara Islands (Dall). Type locality, Catalina Island in 40 fms.

Figured in Bull. 112, pl.6, fig.5; pl.15, fig.11. It seems clear what this is and yet there has been a great deal of confusion about it. Many local collections have this confused with foveolata. The spiral sculpture differs and barbarensis is characterized by spines on the varices, a longer canal. At least this is my idea' (Burch). Mr. A.G. Smith advises as follows " There has been much confusion as to what this really is, as you point out. It is rather thin-textured, yellowish or light-brown in color generally, with a long spire and canal. Whorls ornamented with recurved, often tubular spines, sometimes with blunter varices, as in Bull. 112 figure, which is not typical barbarensis in my opinion. Willett has excellent figures of it in his Baldwin Hills paper (Trans. S.D. Soc. Nat. Hist. 8(30); pl.26, fig.3) although the varices may also be as indicated. We have never found it " in abundance" in Monterey Bay, where our experience indicates it to be rare in 10 fms. with specimens more often found in deeper water to 40 fms."

Collecting data: Dredged off Monterey, Calif. in 25 to 40 fms. (we failed to pick it up on the shallow water shale) ; off Redondo Beach, Calif. in 25 to 50 fms. (Burch); Catalina Island in 30 fms. and San Pedro in 15 fms. (G. Willett); Catalina Island in 30 fms. (Lowe)

Ocenebra epiphanea (Dall),1919. Venice,Redondo Beach,Catalina Island and San Pedro. Type locality, San Pedro, Calif.

Collecting data: off Redondo Beach in 25 fms. gravel bottom (Burch); [illegible]int Re[illegible] Calif ([illegible]we) " [illegible] specimen from off San Pedro is in the [illegible]

Pt. Reyes, Calif. (Lowe); a single specimen of O. epiphanea from off San Pedro is in the Stanford collection (Keen).

Ocenebra tracheia (Dall),1919. Sitka, Alaska in 15 fms.

" O. tracheia (Dall) seemed to me to be distinctive when I studied the holotype. I noted the green color mentioned by Dall is due to algae " (Dr. A.M. Keen). Mr. A.G. Smith reports " Have a young specimen from 12 fms. off Del Monte that may be this species. Mac compared it with the type of tracheia and said it was close. Because the identification is not positive, we have not included it in our list from Monterey Bay. My specimen is undoubtedly different from either barbarensis or any other Ocenebra with which I am familiar."

Ocenebra japonica (Dunker),1860. Dunker: Mal. Blatt. v.6, p.230,1860. Moll. Japan, v.4, 1, fig.14.

This is an exotic species but has become well established and has developed into a major commercial pest in the oyster growing sections of the state of Washington and in British Columbia. It was introduced with seed oysters from Japan. Dr. Trevor Kincaid wrote a very interesting article on it which was published in the South Bend Journal. There are frequent references to it in the various fisheries reports of Canada.

It seems to be very doubtful if this species should be placed under Ocenebra, and in any event it should be separated subgenerically from the native west coast species. Mr. A.G. Smith comments also on this problem as follows " Think there may be a question whether this is really an Ocenebra (or Tritonalia) . Someone suggested Eupleura. Certainly it is not like any of the native West Coast Ocenebras. Full grown ones look very much like shortened Purpura foliata without the tooth."

Bellingham, Wash. (Lowe); Matsushima, Japan (Baker);

****

The following key to species and list of species from the entire west coast is adapted from Mr. A.M. Strong's notebook.

Whorls with 5 or more varices or axial ribs
. Outer lip without an anterior tooth
.. Canal more or less completely roofed over
...Shell fusiform, lip thickened and dentate .... Ocenebra (Tritonalia)
.... Whorls angulated
..... Varices spined at the angle
...... Varices 5-8
.... Varices with scale-like fronds
Ecuador .... dipsacus
Reeve, Murex, 26-111; Tryon, 2-110.
.... Varices winged, with a flat, hooked spine
Ecuador to Peru ....: hamata
Reeve, Murex, 27-119.
.... Varices with a long, guttered spine
30 mm. Panama .... diomedaea
Bull. Mus. Comp. Zool., v.43, p. 313
.... Varices with a short spine or angled knob
.... Spiral sculpture strong
20 mm. British Columbia to Catalina .... barbarensis
Oldroyd, v.2, pt.2, p.25
.... Spiral sculpture fine
20 mm Monterey to Santa Barbara .... subangulata
Oldroyd, c.2, pt.2, p.24

...... Varices 20 or more
.... Spiral sculpture minute
20 mm. Santa Barbara to San Pedro .... squamulifera
Oldroyd, v.2, p.t2.,p.18,

..... Varices forming rounded nodes at the angle
...... Spiral sculpture of fine lines
.... Varices showing as low, rounded ribs
45 mm. Santa Barbara to Magdalena Bay .... poulsoni
Oldoyd, v.2, pt.2, p. 19

.... Varices prominent, plicate
16 mm. Puget Sound to Gulf of California..... michaeli
Oldroyd, v.2, pt.2, p.24.

.... Varices obsolete except at angle
Peru .... squamosa
Tryon 3-111

...... Spiral sculpture of squarish raised ridges
35 mm. Monterey to Magdalena Bay .... foveolata
Oldroyd, v.2, pt.2, p.32

...... Spiral sculpture of imbricated threads
25 mm. San Pedro to Catalina .... epiphanea
Oldroyd, v.2, pt.2, p.26

...... Spiral sculpture equalling axial
20 mm. Sitka to San Diego .... interfossa
Oldroyd, v.2, pt.2, p.21

..... Varices not spined or knobbed at the angle
...... Varices about 8
34 mm. San Quintin Bay .... turrita
Proc. USNM, v.56, p.336

...... Varices about 15
15 mm. Alaska to San Diego .... painei
Oldroyd, vol.2, pt.2, p.20

...... Varices very numerous
Ecuador to Peru .... buxea
Reeve, Murex, 33-170; Tryon, 3-166

.... Whorls not angulated
..... Varices frondose or spined
...... Varices with short fronds
9 mm. West Columbia .... exigua
Tryon, 2-125

...... Varices with squarish frondose points
20 mm. Gulf of California to Central America ... radicata
Reeve, Murex, 31-148; Tryon, 2-125-126

...... Varices with erect spines
30 mm. Gulf of California to Peru .... lappa
Reeve, Murex, 30-142; Tryon, 2-125-126

..... Varices scaly
...... Spiral sculpture absent
15 mm. Gulf of California .... peasei
Tryon, v.2, p.129

..... Varices lamellar
...... Spiral ribs strong
35 mm. Peru and Chile .... crassilabra
Reeve, Murex, 30-146; Tryon, 2-126

(con.)

..... Varices reduced to rounded axial ribs

...... Axial ribs showing on all whorls

.... Body whorl with 14 tuberculate spiral cords

20 mm. Trinidad to Scammon's Lagoon ...... circumtexta
Oldroyd, v.2, pt.2, p.20.

.... Body whorl with 25 spiral cords

.... Axial ribs 10, low, rounded

30 mm. Washington to Venice .... sclera
Oldroyd, v.2, pt.2, p.23

.... Axial ribs 6 or 7, prominent

25 mm. Monterey to Catalina .... fusconotata
Oldroyd, vol.2, pt.2, p.19

...... Axial ribs showing on upper whorls only

.... Spiral sculpture of numerous fine grooves

15 mm. Alaska to Catalina .... lurida
Oldroyd, v.2, pt.2, p.16

.... Spiral sculpture of numerous ridges

15 mm. Monterey to Gulf of California ...... gracillima
Oldroyd, vol.2, pt.2, p.15

List of species of Ocenebra - Mr. Strong used Tritonalia Fleming.

O. barbarensis (Gabb),1866	British Columbia to Catalina
O. buxea (Broderip),1832.	Peru and Chile
O. carmen (Lowe),1935.	Gulf of California
O. circumtexta (Stearns),1871.	Trinidad to Scammons Lagoon
O. crassilabra (Gray),1829.	Peru and Chile
O. diomedaea (Dall),1908.	Panama
O. epiphanea (Dall),1919.	San Pedro and Catalina
O. exigua (Broderip),1832.	West Columbia
O. foveolata (Hinds),1844.	Monterey to Magdalena Bay.
O. fusconotata (Dall),1919.	Monterey to Catalina
O. gracillima (Stearns),1871.	Monterey to Gulf of California
O. hamata (Hinds),1843	Ecuador and Peru
O. horrida (Broderip),1832.	Panama to Chile
O. humilis (Broderip),1832.	Magdalena Bay to Ecuador
O. incisa (Broderip),1832.	Ecuador
O. interfossa (Carpenter),1864.	Alaska to San Diego
O. lappa (Broderip),1832.	Gulf of Calif. to Peru
O. lurida (Middendorff),1848.	Alaska to Catalina
O. michaeli Ford,1888.	Queen Charlotte Id. to Gulf of Calif.
O. painei (Dall)	Alaska to San Diego
O. parva (Smith),1877,	Gulf of Calif. to Galapagos
O. peasei (Tryon)	Gulf of California
O. perita (Hinds),1843.	West Mexico
O. poulsoni (Carpenter),1865.	Santa Barbara to Magdalena Bay
O. pumila (Broderip),1832.	Galapagos
O. radicata (Hinds),1843.	Gulf of Calif. to Central America
O. sclera (Dall),1919.	Washington to Venice
O. squamulifera (Carpenter) (Gabb)	Santa Barbara to San Pedro
O. subangulata (Stearns),1871.	Monterey to Santa Barbara
O. tortuosa (Broderip),1841.	Peru
O. turrita (Dall),1919.	San Quintin Bay
O. vittata (Broderip),1832.	Acapulco to Peru

Genus Urosalpinx Stimpson,1865. Type (by original designation), Fusus cinereus Say.

" Shell elongated oval, or short fusiform, longitudinally ribbed or undulated and spirally striated; aperture with a short canal; outer lip dentate and lirate within. Operculum somewhat like that of Purpura , semi-cordate, with the nucleus at the outer edge a little below the middle.(Tryon).

Urosalpinx cinereus (Say),1822. San Francisco Bay and Elkhorn Slough, Monterey Bay.

This is an exotic species introduced from the Atlantic with seed oysters. It has long been established in San Francisco Bay but Mr. A.G. Smith reports that it is now found in Elkhorn Slough as well.

Collecting data: San Francisco Bay (Gripp); Alameda, Calif.(Gifford) .

Genus Eupleura H. & A. Adams,1853. Type (by subsequent designation Cossmann,1903), Eupleura caudata (Say).

Note key to species on page 38 of this paper.

" Shell with two opposite and continuous varices and smaller intermediate varices; aperture oval, anterior canal of moderate length, open."

Eupleura grippi Dall,1911. San Diego, Calif. in 15 fathoms.

Figured in Bull. 112, pl.5, fig.1. None of the members report having seen a specimen.

Mr. A.M. Strong comments " The figure and description is of a very different shell than the more southern shells placed in this genus. It may not belong here."

Genus Forreria Jousseaume,1880. Type (by original designation), Murex belcheri Hinds.

" Shell large, whorls six or seven, spinose on the shoulder; canal long and somewhat recurved; umbilicus wide and deep. Outer lip smooth, with a prominent spine or tooth, inner lip with a thin wash of callus." (I. Oldroyd, v.2, pt.2, p.49).

Subgenus Forreria s.s.

Forreria belcheri (Hinds),1843. Mugu Bay, Ventura Co. (Burch) to Scammons Lagoon, L.C. Type locality, San Diego, Calif.

This comparatively common large species requires no discussion here other than a comparison with the species placed under the following subgenus Austrotrophon. Grant and Gale, p.727 state this well " ..In general aspect the shell recalls Forreria catalinensis (I.S. Oldroyd), but the thin, expanded varices of the latter are in belcheri closely welded to the sides of the whorl and the shell of Hinds is heavier,more quadrate in shape, and has a relatively shorter and more anterior canal and a more open umbilicus. The genus Forreria may be related to Trophon through such species, that is, via Austrotrophon."

Collecting data: Fine specimens of this species are comparatively common off Redondo Beach in 10 to 15 fms. We have never taken it in deeper water. This was on sandy bottom, not gravel. It is interesting to note that this is miles inshore and far different habitat than the deeper catalinensis. We have taken specimens of this species in most of the estuaries of southern California, Mugu,Anaheim,Newport, and common in the Estero below Ensenada, Mexico. It is obviously carnivorous and in the bays is often found near and oyster or clam bed. (Burch); Mission Bay (Lowe); under fish cannery, La Playa, Pt. Loma, San Diego Co. (Bristol); San Diego (Beckwith); Newport Calif. (Lowe); Todos Santos Bay (Orcutt);

Subgenus Austrotrophon Dall,1902 Type (by subsequent designation, Grant and Gale,1931), Trophon cerrosensis Dall.

" Shell of moderate size, with produced anterior canal, numerous lamellar varices which are prolonged into points or spines on the shoulder of the whorls; spiral sculpture absent or weak." (Grant and Gale).

Dr. Dall considered this group a subgenus of Trophon. However,Forreria has been generally accepted with generic standing.

Forreria catalinensis (Oldroyd),1927. Catalina Island, San Pedro and off Redondo Beach, Calif. (Burch). Type locality, off San Pedro in 25 fms.

This species was long confused with Trophon triangulatus Carpenter and is so misidentified in many collections at this time. Mrs. Oldroyd's diagnosis of the triangulatus matter (Oldroyd, vol.2, pt.2, p.29,1927) with the description of catalinensis has been generally accepted. We will discuss triangulatus Carpenter under Boreotrophon. It is a very different shell from this species.

" The type of F. catalinensis is 100 mm. in length, has seven sharp lamellar frills and no spiral sculpture." (Grant and Gale). " differs from belcheri in having a much narrower body whorl anteriorly, in lacking the constriction in the middle of the body whorl of that species, and in its more extended lamellae."

Collecting data: Dredged off Redondo Beach, Calif. in 75 fms., fine gravel and mud. It is only of passing interest that we took it in so much deeper water than the type came from. Furthermore, we have fine sets of the species from the late Mrs. Eshnaur stated to have been washed ashore on Terminal Island after storms. (Burch); Catalina Island in 30 fms. (Willett);

Forreria cerrosensis (Dall),1891. Redondo Beach, Calif. (Burch) to Cerros Island, L.C. Type locality, Cerros Island in 12 to 48 fms. mud and sand.

This species is closely related to F. catalinensis , but has about 10 lamellar frills per whorl instead of 6 or 7. Inasmuch as the original description of this species is not reprinted in Oldroyd we give it and the reference below for the convenience of members.

Wm. H. Dall, Proc. U.S.N.M., vol. 14, p. 181, pl. 5, figs. 5,7,1891.

" Shell of moderate size, thin, elongate, with seven whorls and eight to ten sharp, thin, elevated varices, each produced into a sharp,recurved, guttered spine at the shoulder; color, white to straw color, with blushes of warm brown; transverse sculpture of fine lines of growth; spiral sculpture of low, rounded bands, with narrower interspaces, which faintly drenulate the varices and outer lip; behind the shoulder these are absent; nucleus small, translucent, smooth, and polished, of one and a half whorls; subsequent whorls flattened behind the shoulder, slightly constricted at the base; canal rather long and wide, flexuous, with a marked fasciole; lip thin, pillar with a moderate whitish callus; throat white, without lirae; operculum dark brown, rather rounded. Longitude of shell, 38; maximum latitude, 25; maximum diameter of aperture, 9 millimetres.

This beautiful form most resembles the young of Chorus belcheri which is much more solid, with fewer varices, and strongly reticulately sculptured The figure of T. cerrosensis, given herewith, is turned so that the aperture is obliquely presented, so as to show the arch of the pillar; if it had been given in full front view the aperture would have seemed more rounded and wider.

This seems to belong to the same group as T. triangulatus , but is a much smaller and more delicate species. A marked characteristic is the difference of sculpture between the part of the whorl in front of and that

(con.)

behind the shoulder".

Collecting data: It should be noted that apparently the only difference between catalinensis and cerrosensis is the number of frills. And one with 6 or 7 and one with 8 to 10 with both being dredged from the same depth off Catalina Island and also Redondo Beach lead one to suspect that it is possible that a large enough series might show all stages of intergrades. If this should be true the name would be cerrosensis obviously. Dredged off Redondo Beach in 75 fms. associated with catalinensis. (Burch); Catalina Island in 35 fms. (G. Willett).

Genus Trophon Montfort,1810. Type (by original designation), Trophon magellanicus (Gmelin)--- Buccinum geversianum Pallas.

It has been our custom to place our species under Trophon. We have several sets of the genotype from Tierra del Fuego, and a comparison of these large coarse shells with comparatively huge body whorls and almost round apertures causes one to wonder why our west coast species were ever given this generic allocation. Certainly none of our species even bear a superficial resemblance to the genoyype of Trophon. Therefore, we propose to give generic standing to Boreotrophon and Trophonopsis. In arriving at this conclusion we have the advice of Dr. W.P. Woodring (Per. Comm. Huly,1945) " I prefer giving Boreotrophon generic rank", and a brief comment on this by Dr. A. Myra Keen " O.K. M. Keen". And on the next group Dr. Woodring also states " I prefer giving Trophonopsis generic rank."

Genus Boreotrophon Fischer,1884. Type (by monotypy), Trophon clathratus (Linnaeus).

" Shell somewhat fusiform, with long, slender anterior canal, axial ribs not developed into prominent lamellae and without long spines on the shoulder of the whorls; spiral sculpture absent or faint." (Grant & Gale).

Dr. Dall placed these species under subgenus Neptunea Roeding , genus Trophon.

Boreotrophon triangulatus (Carpenter),1864. Monterey, Calif. (Burch) to Catalina Island and San Pedro, Calif. Type locality, off Catalina Island in 60 fms. to San Diego, Calif. (Gripp).

As discussed under Forreria this species was long confused by Dall and others with the species catalinensis Oldroyd.

Collecting data: Monterey, Calif. in 20 fms. shale bottom.(Burch); Catalina Island in 30 fms. and San Pedro in 20 fms. (G. Willett); San Diego, Calif. in 50 fms. (Gripp); Catalina Island in 50 fms. (Lowe)

Boreotrophon albospinosus (Willett),1931. Nautilus , vol.45:65,67, pl.4, fig.3,1931. Catalina Island and Redondo Beach, Calif. Type locality, in 30 fm.s off Whites Landing, north side of Catalina Island.

Collecting data: This small species is not uncommon off Redondo Beach in the gravel beds in about 25 fms. We have also picked it up in about the same depth and habitat off Santa Monica, Calif. and off Point Vicente,Calif. (Burch); Catalina Island in 30 fms. (Lowe).

Inasmuch as this description is not in Oldroyd we reprint it here for the convenience of members.

" Similar to Trophon triangulatus Cpr. (Cal. Acad. Sci.3,1864,p.224), not of Dall (Bull. 112, U.S.N.M. 1921, p.109), but larger with proportionately greater diameter, longer spines and different color. In color similar to T. macouni Dall (Can. Dept. of Mines, G.S. Branch, Mem. No.14-N, p.12, pl.1,fig.7), but very different in shape from this species, being much wider proportionately, with shorter canal, more acute angles and longer spines and lacking the prominent spiral cords of macouni.

(con.)

The type, No. 1028 Collection of Los Angeles Museum, has six whorls, the apex being lost. The first two of these whorls are roundly rectangular at the shoulder, the last four very acutely angulated. Varices eight, sharply laminated, forming open, somewhat curved spines at the shoulder. The shoulder keel, between the spines is a poorly defined spiral cord. The type shows no other spirals, but two smaller specimens in the writers collection have an indication of another cord on the body whorl, about one third of the distance from the shoulder to the anterior extremity of the shell. Outer lip thin; canal short and open. Color of shell dark brownish purple; spines white; interior of aperture brown. The type, the largest specimen seen, measures as follows in millimeters. Length,21; diam. 14.4; last whorl 12. "

Boreotrophon dalli (Kobelt),1878. Arctic Ocean to Fuca Strait.
Type locality, Bering Strait.
Boreotrophon dalli alta(Dall)1902. Bering Sea.
to San Diego, Calif.

Boreotrophon scitulus (Dall),1891. Pribilof Islands to Unalaska Island, Bering Sea. Type locality, off Unalaska Island, Bering Sea in 225 fms.
Collecting data: Set in San Diego Museum from Bering Sea in 764 fms. (Albatross,1906); Point Loma, Calif. in 50 fms. (H.N. Lowe and also Dr. Fred Baker).

Boreotrophon disparilis (Dall),1891. Fuca Strait to San Diego (Kelsey, Dall Identification). Type locality, off coast near Gray's Harbor,Wash. in 52 fathoms.

Boreotrophon rotundatus (Dall),1902. Off Pribilof Islands, Bering Sea.

Boreotrophon elegantulus (Dall),1907. Aleutian Islands, Alaska.
Type locality, off Attu Island in 135 fms.

Boreotrophon beringi (Dall),1902. Icy Cape, Arctic Ocean to Puget Sound. Japan. (Dall). Type locality not known.
Collecting data: Punuk Island, Bering Sea in 5 fms. (Lewis)(Willett); Cook's Inlet, Alaska (Arnheim); Unalaska Island and Drier Bay, Knight Id Alaska (W.J. Eyerdam).

Boreotrophon cepulus (Sowerby),1880. Bering Sea and Aleutian Islands. Pleistocene of N. Japan at Volcano Bay (Dall). Type locality ?
Collecting data: Bering Sea (Lewis) (Willett).

Boreotrophon cymatus (Dall),1902. Pribilof Islands, Bering Sea.

Boreotrophon ithitomus (Dall),1919. Lynn Canal, Alaska.
Type locality, in Taiya Inlet, S.E. Alaska in 253 fms.

Boreotrophon alaskanus (Dall),1902. Bering Sea N. of Unalaska in 225 fms .

Boreotrophon avalonensis (Dall),1902. Monterey, Calif. (Burch) to Catalina Island and San Diego, Calif. Type locality, off Avalon, Catalina Island in 80 fms.
Collecting data: Monterey, Calif. in 40 fms. (Burch); Catalina Island in 150 fms.and San Pedro Pleistocene (G. Willett); Catalina Island and San Pedro (Lowe); San Diego in 50 fms. and off Pt. Loma in 135 fms. (Baker)

Boreotrophon eucymatus (Dall),1902. Off San Diego, Calif. and Catalina Island. Type locality, off San Diego in 124 fms.
Collecting data: off Catalina Island in 75 fms. (G. Willett).

Boreotrophon bentleyi (Dall), 1908. Redondo Beach (Burch) to San Diego, Calif. Type locality, San Diego harbor in 20 fms.

Collecting data: Not uncommon off Redondo Beach in about 75 fms. or deeper on mud bottom (Burch); Catalina Island in 30 fms. (G. Willett); off Newport, Calif. (Lowe); San Diego in 60 fms. (Lowe).

Boreotrophon staphylinus (Dall), 1919. Sitka, Alaska to the Coronado Islands Type locality, off Santa Barbara Island.

Boreotrophon calliceratus (Dall), 1919. Monterey to San Diego, Calif. Type locality, off Point Loma, Calif. in 120 to 131 fms.

Boreotrophon pacificus (Dall), 1902. Arctic Ocean southward, on the west to Kamchatka and on the east in deeper water to Acapulco, Mex. (Dall). Type locality ?

Collecting data: Nunivak and Punuk Islands, Bering Sea in 15 fms. (Lewis) (Willett); Frederick Sound, Alaska in 12 fms. (Lewis); Waterfall, Prince of Wales Island (Lowe); Izhut Bay, Afognak Island, 1922 under stones at extreme low tide and Drier Bay, Knight Island, Alaska- about a dozen specimens on herring pound seine. (W.J. Eyerdam).

Boreotrophon multicostatus (Eschscholtz), 1829. Nunivak Island, Bering Sea to San Pedro, Calif. Also northern Japan. (Dall). Type locality, Sitka, Alaska.

Collecting data: Kodiak Island, Sitka, and Forrester Island, Alaska- -low tides (G. Willett); Victoria, B.C. (Lewis); Kodiak Island specimens are very large (G. Willett); Alert Bay, B.C. (Lowe); Japan (Baker); Bear Bay, Peril Strait, Alaska (Baker); Orcas Island, Puget Sound in 10-30 fms. (Baker); Izhut Bay, Afognak Island, and Drier Bay, Knight Island, Alaska- dredged (W.J. Eyerdam).

Boreotrophon peregrinus (Dall), 1902. Catalina Island in 16 fathoms.

Collecting data: We have a note to the effect that this species is in the synonymy of triangulatus Carpenter.

Boreotrophon macouni (Dall), 1910. Port Althorp, Alaska to Barkley Sound, B.C. Type locality, the ship canal, Barkeley Snd., Vancouver Id., B.C.

Boreotrophon orpheus (Gould), 1849. Forrester Island, Alaska (Willett) to Redondo Beach, Calif. and Catalina Island. Type locality, Puget Snd.

Collecting data: Dredged in 50 and 75 fms. off Redondo Beach. (Burch); off San Juan Islands, Wash. (T. Kincaid); Craig, Alaska in 30 fms. and Catalina Island, Calif. in 80 fms. (G. Willett); Victoria, B.C. in 12 fms (Lewis); Kodiak Island, Alaska (Orcutt); Puget Sound (Lowe); Victoria, B.C. (W.J. Eyerdam).

Boreotrophon smithi (Dall), 1902. Pribilof Islands, Bering Sea to Santa Barbara Islands, Calif. (Dall). Type locality ?

Mr. George Willett reports taking this form at Ketchikan, Alaska in 30 fms. and states that it equals stuarti, the following species.

Boreotrophon stuarti (E.A. Smith), 1880. Shumagin Islands, Alaska to San Diego, Calif. Type locality, Vancouver Island, B.C.

Collecting data: S.E. Alaska- general- low tide to 25 fms. (Willett); Prince Wm. Sound in 18 fms. (Lewis); Craig, Alaska in 25 fms. (Lowe); Strait of Fuca, Wash. and Sawmill Bay, Pr. Wm. Sound, Alaska- dredged (Eyerdam).

Genus Trophonopsis Bucquoy,Dautzenberg, and Dollfus,1882. Type (by original designation), Murex muricatus Montagu.

" Shell like that of Boreotrophon but with prominent spiral sculpture and secondary axial sculpture" (Grant and Gale, p. 725).

Trophonopsis cerritensis (Arnold),1903. Dr. Dall in Bulletin 112 lists this species " Cerritos and San Pedro. Pleistocene. " Grant and Gale state that the figure in Arnold looks like a Boreotrophon and so place it. However, there seem to be no Recent records of it and we propose to drop it from our list of the Recent fauna.

Trophonopsis pedroanus (Arnold),1903. This species was described from the Pleistocene of Deadman's Island. There are apparently no Recent records of it. Therefore we propose to drop it from the list of our Recent fauna along with the preceeding species. There is also with this species the question of its generic allocation. Grant and Gale make it a subspecies of orpheus under Boreotrophon.

Trophonopsis lasius (Dall),1919. Southeastern Bering Sea to Todos Santos Bay, L.C. Type locality, off Pt. Pinos, Calif. in 495 fathoms. We are placing all records of the species tenuisculptus Carpenter,1866 to this species. The reference is to an article by Mr. George Willett in the Nautilus 52:10,11 in which Mr. Willett shows that Carpenters species from the Santa Barbara Pliocene is really an Ocenebra,(Tritonalia). The species long identified as Trophon tenuisculptus would therefore be without a name were it not for the fact that it is identical with lasius.

Collecting data: Off Redondo Beach, Calif. in 50 fms. rock and gravel bottom (Burch); Forrester Island, Alaska; S.E. Alaska- low tide to 30 fms. (Willett); Catalina Island in 25 to 60 fms. (G. Willett); Puget Sound (T. Kincaid); south end of San Clemente Island in 40 fms. (Dr. Fred Baker); Bear Bay, Peril Strait, Alaska (Stephens); Catalina Island in 35 and 50 fms. (Lowe); San Juan Islands, Puget Sound (Lowe); False Narrows, B.C. (Oldroyd); Izhut Bay, Afognak Island and Drier Bay, Knight Island, Alaska- dreged (W.J. Eyerdam).

Trophonopsis apolyonis (Dall),1919. Off Santa Barbara Islands, Calif. in 216 to 339 fms.

Trophonopsis kamchatkanus (Dall),1902. Western Bering Sea in 100 fms. Type locality, USFC Sta. 3644, southeast of Kamchatka. Figured in Bull. 112, pl.10, fig.7.

Trophonopsis tripherus (Dall),1902. Fuca Strait to San Diego, Calif. and off Piedras Blancas, Lower Calif. in 485 fathoms (Dall). Type locality, U.S.S. Albatross Sta. 3343, off Destruction Island, Wash. Figured in Bull. 112, pl.15, figs. 8,9.

The figures of this species remind one of Boreotrophon.

Collecting data: Catalina Island in 50 fms. (Willett).

Trophonopsis tolomius (Dall),1919. San Miguel Island, Calif. in 376 fms.

Trophonopsis keepi (Strong and Hertlein),1937. Proc. Calif. Acad. Sci. 4th Ser., vol.22, no.6, p.170, pl.35, fig.8. Known only from the type dredged in 30 to 50 fathoms off the west end of San Nicolar Island, Calif.

Inasmuch as this is not in Oldroyd we reprint the original description for convenience.

" Shell thin, delicate, white; nuclear whorls two, smooth,rounded tilted; subsequent sculptured whorls seven, with strongly tabulated shoulders; axial sculpture of twelve sharp varices, sharply angulated and more or less spinose at the shoulder, continuous over the entire whorl and extending to the canal, where they become lower and closely crowded; spiral sculpture of close, microscopic striations; outer lip thin, angulated at the shoulder of the whorl; body and columella with a coat of white enamel; canal long, slightly twisted and strongly recurved. The type measures: length, 26.9 mm., length of aperture and canal, 14.5 mm., maximum diameter, including varices, 10 mm."

" In outline the single type specimen resembles that of *Trophon tripherus* Dall, said to range from the Straits of Juan de Fuca to off Piedras Blancas, Lower Calif. It differs in the much stronger development of the varices and the lack of the spiral cords. "

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*** Note- The editor has placed the last two species in *Trophonopsis* without having seen either species or having been advised by the authors. Dr. Dall placed *tripherus* here no doubt because of the spiral cords. The figures of both species indicate that they must be very close to the species we label *bentleyi* Dall. This would indicate that they might be more properly allocated to *Boreotrophon.* If this should prove to be the case it will be stated in our Additions and Corrections.

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The following key to species and list from Mr. A.M. Strong's notebook will be of interest. Mr. Strong lists them under *Trophon*.

Whorls with 5 or more varices or axial ribs
. Outer lip without an anterior tooth
.. Canal wide,open,outer lip thin .... *Trophon*
... Whorls coronated with long, guttered spines
.... Varices narrow
..... Varices about 7, interspaces smooth
    100 mm. Catalina and San Pedro ....*catalinensis*
    Oldroyd, v.2,pt.2, p.27.
..... Varices about 10, interspaces spirally threaded
    40 mm. Cerros Island .... *cerrosensis*
    Proc. USNM, v. 24, p. 549
.... Varices expanded , 7 to 10
    80 mm. Magdalena Bay .... *pinnatus*
    Proc. USNM,24, p.549; Proc. USNM, 68, pl.32, fig.5
... Whorls coronated with short spines or angular points
.... Varices 5 to 9
..... Varices narrow
...... Spiral sculpture absent
.... Varices bearing open, radiating spines
    8 mm. Catalina .... *triangulatus*
    Oldroyd , v.2, pt.2,p.29
.... Varices bearing small, erect spines
    21 mm. Sitka to Coronado Islands .... *staphylinus*
    Oldroyd, v.2,pt.2,p.36
.... Varices bearing recurved spines
    14.5 mm. San Diego .... *bentleyi*
    Oldroyd v.2, pt.2, p. 35
...... Spiral sculpture of fine striae
.... Whorls excavated above the shoulder
    23 mm. Catalina .... *peregrinus*
    Oldroyd, v.2, pt.2, p. 36

.... Whorls slopingly shouldered
.... Varices bearing radiating spines
16.5 mm. Catalina to San Diego .... avalonensis
Oldroyd, v.2, pt.2, p.24
.... Varices bearing nearly vertical spines
16 mm. Monterey to San Diego .... calliceratus
Oldroyd, v.2, pt.2, p. 36
..... Varices, wide, thin, lamellar
...... Spiral sculpture absent
47 mm. Bering Sea to Santa Barbara .... smithi
Oldroyd, v.2, pt.2, p.38
...... Spiral sculpture present
53 mm. Alaska to San Diego .... stuarti
Oldroyd, v.2, pt.2, p.38
.... Varices 10
..... Spiral sculpture of 6 to 8 flat ridges
San Ignacio Lagoon to Chile .... horridus
Reeve, Murex, pl,28, fig. 128; Tryon, v.2, p. 146
..... Spiral sculpture of prominent sharp ridges
Galapagos to Chile...................... peruvianus
= xanthostoma Reeve, Purpura 5-24; Tryon 2-146
.... Varices 12 or more
..... Spiral sculpture absent
10.5 mm. Bering Sea to San Diego .... multicostata
Oldroyd, v.2, pt.2, p. 33
..... Spiral sculpture of 3 feeble threads
22.5 mm. Puget Sound to Lower Calif. ...... tripherus
Oldroyd, v.2, pt.2, p. 40
... Whorls not coronated
.... Spiral sculpture absent
..... Varices 13 to 15
21 mm. Santa Barbara Islands .... apolyonis
Oldroyd, v.2, pt.2, p.40
..... Varices 15 to 20
...... Whorls rounded
25 mm. Arctic Ocean to Acapulco .... pacificus
Oldroyd, v.2, pt.2, p. 35
...... Whorls angularly shouldered
26 mm. San Diego .... eucymatus
Oldroyd, v.2, pt.2, p.35
..... Varices about 35
19 mm. San Miguel Island .... tolomius
Oldroyd, v.2, pt.2, p. 41
.... Spiral sculpture present
..... Spiral carina on the periphery of the body whorl
10 mm. Gulf of California .... mazatlanicus
Proc. USNM, vol.24, p.246
..... Spiral sculpture of several equal ridges
Bering Sea to Todos Santos Bay .... lasius(tenuisculptus.)
Oldroyd, v.2, pt.2, p. 39

List of Species

Subgenus Austrotrophon Dall,1903.

Austrotrophon catalinensis Oldroyd 1927	San Pedro and Catalina
Austrotrophon cerrosensis Dall,1891	Cerros Island
Austrotrophon pinnatus Dall	Magdalena Bay and Pt. Abreojos

(con.)

Subgenus Boreotrophon Fischer,1884

Boreotrophon albospinosus Willett	Catalina Island
Boreotrophon apolyonis Dall,1919	Santa Barbara Islands
Boreotrophon avalonensis Dall,1902	Catalina to San Diego
Boreotrophon bentleyi Dall,1908	San Diego
Boreotrophon calliceratus Dall,1919	Monterey to San Diego
Boreotrophon citricus Dall	Easter Island
Boreotrophon diazi Durham	Gulf of California
Boreotrophon eucymatus Dall	San Diego
Boreotrophon keepi Strong and Hertlein, 1937	San Nicolas Island
Boreotrophon laciniatus Martyn	Chile
Boreotrophon lorenzoensis Durham,1942	Gulf of California
Boreotrophon mazatlanicus Dall	Mazatlan
Boreotrophon multicostatus Eschscholtz,1829	Bering Sea to San Diego
Boreotrophon pacificus Dall,1902.	Arctic to Acapulco
Boreotrophon panamensis Dall,1902.	Bay of Panama
Boreotrophon peregrinus Dall,1902	Catalina Island
Boreotrophon peruviana Lesson,1830	Galapagos to Chile
Boreotrophon smithi Dall,1902	Bering Sea to Santa Barbara
Boreotrophon staphylinus Dall,1919	Sitka to Coronado Islands
Boreotrophon stuarti E.A. Smith,1880	Alaska to San Diego
Boreotrophon lasius Dall (tenuisculptus Carpenter)	Bering Sea to Todos Santos Bay
Boreotrophon tolomius Dall,1919	San Miguel Island
Boreotrophon triangulatus Carpenter	Catalina and San Pedro
Boreotrophon tripherus Dall,1902	Juan de Fuca to San Diego

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* Note- We plan to complete our report on the Thaisidae in our next issue.

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Additions and Corrections

Buccinum striatissimum Sowerby,1899. Ann. Mag. N. Hist., ser. vii, vol. Iv,p.370,fig.1,Nov. 1899. Type locality, Japan.

This species is to be added to our faunal list. The following note has been received from Dr. A. Myra Keen " In the Stanford collection there are specimens from 937 fathoms off Pribiloff Islands and one large adult from Lynn Canal (lat. 58), Alaska, collected by Dr. Harold Heath. "

When available we will reprint the original description for the convenience of members. Dr. W.H. Dall, Smithsonian Misc. Coll., vol.50, pt.2,No. 1727, p.140 discusses the species as follows (1907) " This fine species is rather abundant in the dredgings, having been obtained on the south coast of Yesso, Tsugaru Strait, the Sea of Japan, and the southwest coast of Korea in from 50 to 568 fathoms. Until the series was compared I was inclined to suspect that this species was identical with the following one (B. bayani Jouss.), but a study of the series leads me to conclude that, though extremely similar in surface characters and general appearance, the present species can always be distinguished by its rounder whorls and more deeply constricted sutures. It reaches a length of some 120 and a diameter of 65 mm."

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The following collecting records were received from Mr. W.J. Eyerdam after the stencils were cut for this issue.

Nassarius fossatus (Gould),1849. San Juan Id.-dredged

Nassarius mendicus (Gould),1849. Port Orchard, Kitsap Co.,, Rosario Beach, Skagit Co., Alki Pt., Seattle, King Co., San Juan Id.,San Juan Co. Wash., Drier Bay and Thum Bay, Knight Id., Pr. Wm. Snd., Izhut Bay, Afog--nak Id. and Sitkalidak Id.,Alaska . Found under stones - common in

(con.)

Puget Sound and some parts of Alaska but generally scarce in Alaska.

Nassarius perpinguis (Hinds),1844. San Juan Id., Wash.- dredged- Note- I have never found it on the beaches in Puget Sound and it is also scarce in dredgings.

Mitrella gausapata (Gould),1850. Alki Pt., Seattle, King Co., Port Orchard, Kitsap Co., Rosario Beach, Skagit Co., Wash. and Drier Bay, Knight Id., Prince Wm. Snd., Alaska. It is generally to be found on eel grass or algae. * Extended range-*- about 700 miles N. from Forrester Island. Note- I have always found only M. gausapata in the north, so it should not be treated as a synonym of carinata, but retained at least as a subspecies or even a distinct species.

Mitrella tuberosa (Carpenter),1865. Drier Bay, Knight Id., Pr. Wm. Snd . Alaska- dreged- * Extended range northward from Forrester Island about 700 miles.

Mitrella rosacea (Gould),1840. Unalaska, Aleutian Ids., 1932

Mitrella permodesta (Dall),1890. Unalaska, Aleutian Islands,1932.

Mitrella gouldii (Carpenter),1867. Izhut Bay, Afognak Id. , Alaska,1922

Amphissa columbiana Dall,1916. Puget Sound, Wash., Izhut Bay,Afognak Id. Knight Id., Pr. Wm. Snd., Sitkalidak Id. and Raspberry Id.,Alaska. My experience has been that I have difficulty in separating this species from versicolor as some of the colonies of columbianus are not only colored like versicolor but match them in average size.

Amphissa reticulata Dall,1916. Puget Sound, Wash.

Amphissa versicolor Dall,1871. Sitkalidak Id. and Izhut Bay, Afognak Island, Alaska.

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The following data was received from Mr. A.G. Smith after the stencils were cut.

Fusinus- " Since writing this I have one more comment on Fusinus, which is that the type of F. kobelti Dall came from Catalina, as indicated in the explanation to his figure in the Proceedings of the USNM. This leaves the Monterey species open for a new name, which, for the time being, I am continuing to call monksae for label purposes, as it is the living descendent of this species."

Ptychatractus californicus Dall- 36-51 fathoms off Pt. Pinos, in soft dark gray mud; one young specimen (USFC Sta. 4464).

Macron lividus (A. Adams)- Reports of this from Monterey are based on a lot, so labelled, in the National Museum. I doubt its occurance there and also question the Farallone Ids. record.

Mohnia vernalis Dall- Off the mouth of Salinas River in 581 fms. in green mud and sand; rare.

Exilioidea rectirostris (Carpenter)- Use this genus name rather than Exilia following Grant and Gale, and think it belongs in the family where Dall left it. It certainly doesn't belong in the Fusinidae, at all, in my opinion. 389-456 fms. off Pt. Pinos; rare. Also dredged off the Mendocino Co. coast.

Exilioidea kelseyi (Dall)- About 100 fms. off La Jolla; one specimen.

* Note- Of course, there is always the possibility of creating a new family Exilioidiadae to take care of the above two species, as there is so much doubt as to just where they do belong.

Plicifusus griseus Dall- 381-633 fms. off Pt. Pinos; scarce

Colus apholus (Dall)- 750-766 fms. off Pt. Pinos; one specimen

Colus clementinus Dall- 627 fms. off Pt. Pinos; rare.

Colus georgianus Dall- 750-766 fms. Off Pt. Pinos; rare

Colus halidonus Dall- 331-633 fms. off Pt. Pinos; rare

Colus jordani (Dall)- 633 fms. in Monterey Bay

Colus severinus (Dall)- 278 fms. off mouth of Salinas River; 296 fms. off Pt. Ano Nuevo; scarce

(con)

Colus trophius (Dall)- 750-766 fms. off Pt. Pinos; rare
Neptunea tabulata (Baird)- 50-80 fms. off Moss Landing, Monterey Bay. 202 fms. off Watsonville Beach. Taken by set line fishermen 200 fms. off Davenport, Santa Cruz Co. Scarce, in the Bay.

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We are indebted to J.R. le B. Tomlin, 23 Boscobel Rd., St. Leonards-on-Sea, England for the following advice on one of our questions brought up in Munutes #48.

" I enclose a note referring to the queries in your Minutes #48, p.3 re *Bulla quoyii* Gray. Dieffenbach's Travels is a rare book over here- his name is misspelt and the date wrongly given on your p.3. I hope that the complete citation which I give will help to clear up *quoyii*, though it has already been accurately given by Pilsbry in the Manual.

The fact that it is unreservedly accepted by Suter in his big N.Z. Manual ought to be sufficient to excise the name entirely from any Californian connection.

Dieffenbach's book was called " Travels in New Zealand, with contributions to the geography, geology, botany and natural history of that country" by Dr. E. Dieffenbach, 2 vols., 1843.

In vol. II, pp 177-296 are headed " Fauna of New Zealand" and "Notes on the materials at present existing towards a Fauna of N.Z. by John Edward Gray, F.R.S., keeper of the zoological collections in the British Museum". Pages 228-263 are headed " Shells" and " Catalogue of the species of Mollusca and their shells which have hitherto been recorded as found at New Zealand, with the description of some lately discovered species by J.E. Gray".

On p. 243 is the following item:- " Fam. Bullidae. no.113. *Bulla quoyii* Gray, n.s. *Bulla striata* Quoy et Gaim. Voy. Astrol.ii,354, t.26, f.8,9. Inhabits New Zealand, Quoy. Stanger.

Shell ovate, smooth, marbled with purplish-grey and white dots; spire perforated. Like *Bulla striata* Lam. but quite distinct.".

From this I take it that one must regard *Bulla quoyii* Gray as a substitute name for, and a synonym of *B. striata* Q. & G. This is all correctly stated by Pilsbry in the Manual XV,348. I do not think it is correct to speak of *quoyii* as of " Gray MS" as you do in #48, p.3: a considerable part of the 2nd vol. of the " Travels" was written by Gray and published as by Gray.

Suter in his excellent " Manual of N.Z. Mollusca" accepts *quoyii* Gray as endemic, with localities Bay of Islands and Auckland Harbour. It was Carpenter and Arthur Adams who went wrong."

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Dr. W.R. Coe, Scripps Institution of Oceanography, La Jolla, Calif.

Dr. Coe advises that the holotype and several pratypes of the *Mytilus edulis diegensis* Coe have been sent to the U.S. National Museum.

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Dr . A. Myra Keen of Stanford University has sent us the following note.

" Two new Opinions of the International Commission on Zoological Nomenclature will be of interest to malacologists:
Opinion 160, entitled, " On the status of the names *Anguina* Scopoli,1777 *Anguillulina* Gervais van Beneden,1859" ... etc. Issued April,1945,price four shillings. The summary says, " For so long as generic names published by authors using a binary, though not a binomial, system of nomenclature are recognized as complying with the requirements of Article 25 of the International Code, the generic names published by Scopoli in 1777 in his *Introductio ad Historian Naturalem* are to be accepted as available nomenclatorially, but the position will need to be reexamined if later it is decided to reject generic names published by authors not applying the binomial system"

(con.)

Opinion 184: " On the status of names first published in volumes 1 to 11 of Martini (F.H.W.) and Chemnitz (J.H.), Neves systematisches Conchylien-Cabinet, Nurnberg,1769-1795". Issued October,1944. Price, three shillings. The summary repeats the same decision reached with regard to Scopoli as to the validity of generic names and continues, " No new specific or subspecific trivial name published in these volumes has any status in nomenclature."

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Dr. Keen also mentioned the following items of interest -

Lt. Col. Schenck (Dr. Schenck of Stanford University) was recently awarded the Bronze Star for meritotious achievement in operations against the enemy in the Pacific.

MacKenzie Gordon , who was in briefly, says Allyn Smith and the Academy already have plans for his spare time; Mac is off to Brazil for an 18 month's stay surveying a coal basin.

Carmelo Thake,284 Fleur-de-Lys Road, Birkirkara,Malta. Members wishing to exchange had better get out their pencils because this letter will be followed by others wishing exchanges. " ... Your name having been indicated to me as that of the Editor of papers prepared and issued by the Conchological Club of Southern California, I venture to ask for a prospectus of your club which I would like to join at the earliest opportunity. For your information I must say that I cannot by any means be classified as professional conchologist but I have no hesitation in claiming to be a very ardent enthusiast, and as such most eager to contact conchologists , whether professional or amateur, in any part of the world. My shell collection which numbered several thousands, most unfortunately was severely damaged, and of course, irreparably, through enemy action; but what at great pains I have succeeded in salvaging (something in the neighborhood) of 5000 specimens all sold) is I consider enough encouragement to make me attempt rebuilding what I have always held as my treasure. ..."

Virgil Ebeyer, 146 Old College Street, Sliema, Malta. " I humbly beg to join the Conchological Club of Southern California. I wish to improve my shell life knowledge and although I am still a beginner in collecting shells I am able to make local exchanges for local species. ...."

Mrs. Lillias F. Cockerill, Sanibel,Florida. " The July copy of the Minutes has just arrived and promptly read, I am greatly interested in the item re the egg laying process of the Strombus pugilis alatus. Folks here seem to have been under the impression that it was viviparous. Dr. Louise Perry expressed the opinion to me some years a go when I was making a collection of all the different egg cases I could find here. She identified most of them for me, but one she had never seen before. She asked for part of it and sent some to three museums for identification. Each gave a different identification. Two she said she knew were wrong and I never did know for certain what it was. Dr. Perry often succeeded in hatching out young mollusks and having powerful microscopes was able to identify very minute material. When the Strombus next appear in quantities on the beach I shall make a point of trying to find some of them extruding. I am afraid Dr. Bales is right about the destruction of the Liguus. The fires in the Everglades have been very extensive. Just a hint re obtaining lumber for shell trays. Being absolutely unable to buy any new material, plywood etc. I went to a firm handling glass and bought some of their used glass crates. The sides are quarter inch and do very well for tray bottoms. Window stopping $\frac{1}{2}$" x 3/4" makes sides for shallow trays and some of the crate ends about 2" is usable for deeper trays."

Dr. Austin W. Cheever, 464 Beacon St.,Boston 15, Mass. We thank you for the " Toward support of your conchological notes"

F.S. Webber, 271 Maple St.,Holyoke, Mass. Again our cordial thanks for the check even though Mr. Webber must have already qualified for something like a life time membership if we had one.

Ralph O. Fox, 1048 Monterey Ave., Berkeley 8, Calif. " I have enjoyed the last years papers very much and am glad to be associated with your group, altho I am just an amateur. I have a very good friend in Allyn Smith who has given me many fine duplicates which has done much to add to the value of my own collecting. I am the Skipper of a local Sea Scout Ship and am looking forward to the time when I can obtain enough gas to use our boat for some dredging here in the bay region. Allyn Smith's results, even with an old pail (years ago) presents something to think about. I want to obtain a nice specimen of Tivela stultorum Mawe. Could you suggest a person who might have one for sale ?"

* Note* The editor is a bit amazed at that Tivela request, but at that, it doesnt range that far north. The Pismo Clam is a commercial article of food and a nice burlap bag full of full size specimens should be had on request at the back door of any restaurant in Pismo Beach. Surely one of our members will take care of this modest request.

Walter J. Eyerdam, Oceanic Fisheries, Port Vita, Alaska. " ... I think that a good many species of Alaskan shells are known only from National Museum collections obtained mostly by the fish commission and other government services, I don't get much time to write or collect shells as we are starting to work a little longer hours and I am also making a good botanical collection. The list of shells for Port Vita and vicinity along Raspberry strait is now up to 70. There are several considerably beyond their previously known geographical limits which I will report on at the end of the season. If I had a dredge, I am sure that good results would be had. If I ever do come up here again I shall bring a dredge."

Miss Lena Higgins, 2224 Orange Ave., Long Beach 8, Calif. Please note that this is a new address for Miss Higgins. " I'm very glad you are now accepting a definite stated sum for your excellent publication." Miss Higgins sends her check to cover a subscription to go to,

Miss Lillian Zech, 535 W. Highland , Redlands, Calif. Miss Zech is one of the pioneer members of this club, and we are glad to hear of her again.

L.M. Wright, CEM, U.S. Navy, 422 Plaza Hotel, Miami, Florida. Mr. Wright has been receiving our papers but we have a notice from the U.S. Navy that he is no longer at this address and 2nd class mail is not forwarded. If any of our correspondents in the services move or change their address please advise us because otherwise we continue sending the papers and I assume they go into the Navy's waste paper drive.

William K. Emerson, 2435 Bancroft St., San Diego 2, Calif. " I am just about to re-mimeograph my collecting list of duplicates and plan to get several exchanges completed before my summer vacation is over. I don't know whyther I have told you before, but I am majoring in marine zoology at the San Diego State College and hope to teach same some day. Are you planning to do any extensive dredging in the post war era such as you did at Redondo ? While you were still living there , I had hoped I could join you and Tom dredging some afternoon and learn the little tricks which mean success. I hope to do some dredging in our bays off the coast some day, and build up the few deep water species in my little collection. At present, I have very few dredged species.

As I said in my last note, I am interested in exchanging local marines for common species of northern California, Oregon, and Washington. There are many common species from that region which I don't have in my collection, and of course, I have nothing from Alaska. Possibly you could recomend collectors from the above mentioned areas who might want to exchange and I could get my duplicate lists off immediately."

E.C. Doremus, 227 Holmes St., Boonton, N.J. This is a flattering note " I keep them in a binder and want to have a full set."

James M. Stephenson, 207 Quincy Ave., Long Beach 3, Calif. Thanks for the check but we miss you at the meetings.

" Elementary Guide to the Fossils and Strata in the Vicinity of Cincinnati" by Walter H. Bucher, May,1945- 31 pages- 9 pages of plates- published by the Cincinnati Museum of Natural History.

This is really a splendid booklet and should be used by other sections as a model. The plates are particularly fine and clear. They were prepared by Kenneth E. Caster and Stewart M. Jones who should be congratulated for doing a very nice job.

" The Journal of the Cincinnati Society of Natural History", April,1945 vol. 22, no.4 is devoted to a paper by Elizabeth R. Kellogg " Joseph Dorfeuille and the Western Museum".

This is a splendid article devoted to one of our pioneer scholars. It is almost exactly the type of work that I suggested to a friend a short time ago that should be made available to honor a number of our early California naturalists. Some of the men who accomplished a great deal in their day have been so forgotten that it is difficult to trace much about their lives or accomplishments.

" Shell Notes" by Frank Lyman, Lantana, Florida, No. 13 has been received. Note that Frank's family is now increased from three to four and congratulations to the Lymans. The same thing happened to the John Burch family some time ago but we are now five being one up on Frank. Between lines being written here " Gramps" is entertaining the latest addition now aged 10 months.

E.P. Baker, 417 S. Downey Ave., Downey, Calif. Ned is home again after another siege at the General Hospital. That hand of his is giving him a lot of trouble. " Sorry to miss the last meeting, but was thinking of you all. Will be in the high Sierras when you meet again., but will keep an eye open for anything of interest. Trust we will be present for the Sept. meeting. As to the time of meeting, I think I stated our preferencee at the time. We like the Sunday afternoon meetings the best, but should the club decide to meet in the evenings, any evening but wednesday we could setaside. I note by the June Minutes an illustration of our much discussed mussel tagged with the name M. edulis diegensis Coe. Is that the final decision ? If so, what is M. dunkeri Reeve?

*** Note* Mytilus dunkeri Reeve is a Japanese species or rather one of the names of the species since dunkeri is now in synonymy. Dr. Coe decided that our southern California shell is an undescribed subscpecies of Mytilus edulis which he described and named diegensis. Our shell is not the Japanese species.**-

Irene took a small group of summer school kidsto the museum last week and Dr. Hill gave them a swell time. They had been mulling over some of our duplicates and getting acquainted with some of the local shells. Tomorrow in their general assembly I am giving them a 30 min. Seashore Parade.#

Charles A. Allen, 1094 South King St., Honolulu, T. Hawaii. We were very happy to have a long letter from our good member in Hawaii. Parts of it follow: " I am sending you separates in color of the Hawaiian Cypraea; published by Wray Harris, December,1942, Paradise Pacific, p.65.

In reply to your request, there are no publications on Hawaiian shells at the present time. Dr. Edmondson is revising his book on Hawiian shells, and it will be off the press in a few months. When available will send you a copy.

I am publishing a book entitled, " SHELLS OF HAWAII" which will be entirely in color. It will be off the press in about eight months, which explains my reason for not writing sooner.

I have done very little collecting this year, due tothe fact that the shooting gallery has kept me consistently occupied. Enclosed herewith , is a small contribution. Please keep the " Minutes" rolling in. I would not be without them.

I am also sending separates on Hawiian land shells. If you wish more of these and the Cypraea, please let me know.

In what little collecting I have done, I find that there are not nearly as many shells as there used to be. Due to the fact that service men and civilians have taken a trememdous quantity of material from the reefs. In fact, any of the larger shells are becoming scarce. Of course some of the reefs have been restricted,and when these are again available there will probably be quite a few shells there. The land shells are becoming extinct. In another twenty-five years there will be no more.

I managed to pick up a pair of Cypraea aurantia. It is a very handsome pair, and I am very proud of them.

Have you received a copy of the " New Conus"? Descriptions by Bartsch and Rehder, published by the Biological Society, Washington, D.C. The new conesare smirna,eugramatus, hammatus,halitropus, and spiceri.

A.G. Stevenson, 32 Pentland Ave., Mt. Eden, Auckland, New Zealand. " Both Miss Holloway and I were much perturbed to hear that you intend to discontinue sending the Minutes to a certain number of correspondents. Now, we value the Minutes very much and do not know how we could do without them. Your check lists and descriptions have been invaluable to us in sorting and identifying our fairly large American collections, and we do hope that you will not strike us off the list. For some time we have beenwondering what we could do in the way of helping you with the publication. It is practically impossible to send money out of the country just now and we had finally decided to send you some shells instead. You could either keep them yourself or perhaps sell them and put the money to the fund for publishing the Minutes. We have started to pack a small lot of shells and will forward them in the next day or two. If you have any special fancies please let us know and we may be able to help you. Also, if necessary we could send publications in exchange for the Minutes. The main thing is that we do not wish to miss the Minutes.

* Note- After such a flattering paragraph the editor will certainly see that our good friends in New Zealand get all issues. And the shells will be happily received and passed out to our members at the meetings- (perhaps after the editor does a little picking though).

Miss Holloway has received all issues lately I think but mine have been fairly erratic. I have missed quite a few. Also they do not come very well on the flat, as you send them now. May I suggest that it might pay to fold or seal all overseas copies. It is rather dissapointing to receive copies minus a page or two. In fact, it is quite possible that the page bearing the address may be detached and lost in transit.

Now that the Japs are getting farther and farther away, we areable to relax and think about our hobbies again. The old threads are being picked up again and collectors are getting busy on the rocksand beaches. "

* Note- Mr. Stevenson sent this letter by air mail and it took just 7 days to reach this desk. Not bad from New Zealand.

Miss Verna Mann, 3030 W. Thornton Ave., Burbank, Calif. " I've been in Lemmon Grove for several weeks.... I am in summer camp over the next meeting ..."

Mrs. Jean Wilkins, 5939 Gundry, Long Beach " You will be sorry to know I have not yet catalogued the Tremper collection through the Muricidae. I hope to be present Sunday and I'll bring what information I have...."

Minutes of the Conchological Club of Southern California- August 5, 1945

The meeting was called to order by vice-president W.O. Gregg. Notice of the passing of Mr. George Willett was read. Dr. Gregg appointed as a committee to draft a memorial to Mr. Willett- Dr. H.R. Hill, Mr. J.Q. Burch, and E.P. Chace.

There were no reports from committees other than those included in the Minutes.

Discussion was led by Mr. J.Q. Burch beginning with Ocenebra, who went on to point out that the genotype of Trophon is a Patagonian shell, with a large round body whorl, making it impossible to place any of our shells in that group so Mr. Burch suggests that we have three local members of one group, properly called Forreria, and out smaller ones belong to two different groups Boreotrophon and Trophonopsis. The next group discussed was the Epitoniidae followed by the Janthinidae.

We were happy to have present Dr. and Mrs. Joshua L. Baily Jr. from San Diego.

Adjournment was in the usual manner.

Elsie M. Chace, Sec. Pro. Tem.

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NOTES ON PYRGULOPSIS NEVADENSIS (Stearns).- In a recent issue of the "Minutes" (49:44), this species was listed as "Pyrgulifera nevadensis (Stearns)." This is evidently incorrect, being copied from an apparent mistake in spelling which occured in Henderson's Supplement to his "Non-Marine Mollusca of Oregon and Washington.", June, 1936, p.277. The genus Pyrgulopsis was described in 1886 by Call and Pilsbry with Pyrgula nevadensis Stearns as the genotype. This species has been reported from Pyramid and Walker Lakes, Nevada and from Upper Klamath Lake, Oregon. A single fossil specimen of this species has recently been collected with other Pleistocene fresh-water shells on the shore of the Salton Sea at Fish Springs.--- Wendell O. Gregg.

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E.V. Edmonds, Metropolitan Hotel, South San Francisco, Calif. The above is Eve's new temporary address. Don is gone presumably to the Pacific.

Mrs. Effie M. Clark, P.O. Box 511, Yuba City, Calif. We have had several letters from our secretary who is with her son on his ranch in northern California. Mrs. Edmonds will visit her there the next few weeks and they will then return together if plans are carried out.

Ernest N. Wilcox, 1738 Johnson Ave., San Luis Obispo, Calif. " .... We plan to spend two days at Baywood Park, Morro Bay next week if we can get any place to stay and may go on to Cambria. Our vacation last year was spent at Big Sur and was uneventful except for a delightful afternoon spent with Andrew Sorensen at Pacific Grove. He has about 60 species of Haliotis and it was a joy to look them over. ... Not much collecting these days. While we were away last week some neighbor boys went in the back yard and turned loose a pair of Helminthoglypta walkeriana snails that I had been keeping since last Thanksgiving."

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The death of Mr. George Willett, president of the Conchological Club is a personal loss to each of us. Few men are held in the affection and exteem of their fellows as Mr. Willett has been. Our next issue will contain a memorial to his life and scientific work.

Mr. Willett was 66 years of age. Memorial services are to be held by the Elks Lodge followed by burial with military honors by Roosevelt Camp of United Spanish War Veterans in the Sawtelle home cemetery.

Thaisidae
Coralliophilidae
Epitoniidae

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
September 1945

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, non-members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or $1.25 each six months.

Our next meeting will be held October 7, at the Los Angeles Museum, Exposition Park, Los Angeles, Calif. at 2:30 P.M. All interested persons are welcome.

We are now meeting the first Sunday of each month.

Please mail all news about shells, shell publications, shell collectors, shell trips, localities etc. to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.

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We still have on hand a few copies of our bound Distributional List, Part I, Pelecypoda, for which we are asking $5.00 to our fund.

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Trevor Kincaid, State of Washington, Department of Fisheries, Oyster Laboratory, Ocean Park, Washington.

Professor Kincaid recently sent us two lots of shells from Ocean Park, Wash. and both sets are of considerable interest. Both seem to be extensions of the ranges recently published.

First- " One of the oystermen brought me a handful of gastropods several days ago which are new to me. As I am out of touch with the literature I am sending you a few specimens for examination. It seems to be a Nassa but does not agree with the species of this genus that I have encountered in Puget Sound. You can probably spot it at once."

Note-* - The shells sent are the species we discussed in Min.#51,p.9- Nassarius (Ilynassa) obsoletus (Say),1822. This species was introduced from the Atlantic into San Francisco Bay presumably with seed oysters and has become quite common, but this is the only other record we have from this coast and it is interesting to find it established in the state of Washington.

Second- " I am sending you another mollusk that is unknown to me as a native of this region. It is a snail which is devastating gardens in this vicinity. I hardly think it is native to this territory. You are straightening out a lot of moot points and heading up a lot of others for a solution. More power to your elbow."

Note-*- This is the species discussed and figured by Dr. Pilsbry in his new " Land Mollusca of North America" on pp 4,5, none other than our common garden pest Helix aspersa Muller,1774. Every seed store in southern California put up window displays of Snairol or other controls for this pest. However, I note that Dr. Pilsbry does not list it from the state of Washington so assume that this is also an extension of range. The species was originallt introduced from Europe.

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Glenn R. Webb, Ohio, Illinois. The following letter was the first we had heard of Glenn's return. " Since my recent release from military service, I have been busy digging out the specimens I sent back from overseas. So far none seem to have survived despite attempts to coax them into activity.

One bright spot amid the odor of dried-in-snail and dust was a year old package of Otala lactea Muller sent from Texas by Mrs. Sebesta last June. Of the 51 specimens 66.7% have survived their approximetal 13 months of aestivation. Probably the survivors can be successfully fattened up for anatomical purposes. My main objective at the moment is the assemblage of as great a variety of captive specimens and species as possible to allow the resumption of studies interrupted by military duties, as well as prepare fo for entertainment for the coming winter. Perhaps some of the club members would care to exchange live specimens of their local slugs and snails for shells and radular material of English,French, and Indiana-Illinois material. With my complete recovery, I hope to make several short collecting trips about the country; but that won't be for awhile yet. Thanks for sending me copies of the Club Minutes during my absence."

L.M. Wright, CEM, U.S. Navy - A.B.S.T.C.-A 9 Camp Peary, Williamsburg, Va. Mr. Wright complained of not receiving a copy or so of our paper, but the reason for that was simply that the Navy will not forward second class mail and we were notified that they were not forwarding it. Wright says " ... Although as you can see I am stationed temporarily in Virginia, I would like all Minutes and correspondence addressed to my home Enterprise, Florida (no street necessary- very small town). Mrs. Wright will forward my mail. Will appreciate suggestions as to indexing the Minutes. I have in mind a loose leaf indexed memo book which would show families,genera,subgenera & species and these for classifications further subdivided by symbols as D-description, M- mention, F- figure, followed by the page number of course, and the Minutes number bracketed after the page number. Thus I believe a living file can be built up and kept going. I expect to bind the Minutes ib vols. #50 concluding vol.I. Guess I'll have to write a preface. Have been unable to collect any interesting living shells since leaving Miami but the Miocene fossils are interesting to me and I very recently sent my dear friend Mrs. Kate Stephens an assortment."

* Note* Upon the conclusion of our coverage of the fauna of this coast we plan to publish a complete check list with references to the Minutes in which they are discussed. Everyone can work out an indexing system of their own and any plan will work if kept to date. I started out with 3 x 5 cards and made a card for every reference I found to California species. The only trouble with this is that I am now working with exactly 29 drawers full of cards.

Mr. W.P. Cook,2966 Union Ave., San Diego 1 has been ill and we are pleased to hear in a letter from Mrs. Joshua L. Baily Jr. that Mr. Cook is much improved. We were honored to have as our guests last week Dr. and Mrs. Baily.

Albert Bauman, 6136 Lexington Ave., Los Angeles 38, Calif. Our member dropped in for a visit last week and spent the evening. He was in the uniform of the U.S. Army wearing an interesting display of service ribbons and stars. Our collection was enlarged by the addition of quite a number of land shells from Germany and Europe. Bauman had one very interesting lot of showy tropical marine shells which he collected in Germany. The interesting thing about them was that he collected them in the street near the spot where a German museum had been just before a bomb hit it. He was expecting to be shipped direct to the Japanese war, but that was several days before the peace news and it is possible that his plans may have been changed.

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The Bulletin for June, of the Natural History Museum of San Diego is at hand. One interesting note that might give an idea to some of our members was an account of several rare finds in the way of fossil mollusks in the excavations or cuts exposed by new construction projects. One lot of Pliocene material was stated by Dr. Hertlein of the California Academy to be new species. Dr. U.S. Grant IV has resigned as a director and Dr. Carl L. Hubbs was elected in his place.

Family THAISIDAE

Genus Thais Roeding,1798. Type (by subsequent designation, Dall,1909) Thais neritoides (Lamarck)- Murex fucus Gmelin

" Shell stout, spire low, aperture large, columella flattened, anterior canal very short; sculpture predominantly spiral ,modified into scales nodes or even spines , axial sculpture absent or of lameller irregularities"

Subgenus Nucella Roeding,1798. Type (by subsequent designation, Dall 1909), Nucella lapillus Linnaeus.

" Shell usually with a higher spire than typical Thais , and with spiral and axial sculpture both present, the latter sometimes well developed, or with both spiral and axial sculpture obsolete or nearly so."

Typical Thais has an anal notch in the aperture which is entirely lacking in Nucella. " (Grant and Gale, p. 716)

Dr. Dall in Proc. U.S.N.M. vol.49, 1915 gives a fine discussion of this group.

Thais lamellosa (Gmelin),1792. Port Clarence, Bering Strait and southward on the west to Sado Island,Japan Sea, on the east to the Aleutian Islands and Santa Barbara, Calif. Pliocene and Pleistocene of California and Oregon (Dall,1921). " The type locality for T. lamellosa is Cook's Strait, New Zealand" (Dr. A.M. Keen).

" This exceedingly variable species has been thoroughly overnamed. In the Oldroyd collection at Stanford University there is a series of specimens showing all intermediate steps from smooth forms to those with strong axial frills and from small, low spired individuals to large, high-spired individuals. This species affords a classic example of individual variation. The varietal names proposed by Dall (1915) have absolutely no systematic value" (Grant and Gale,1931, p.717).

Therefore, Grant and Gale place all of the varieties in the synonymy of the typical. The consensus of opinion is that it is but one species but some hesitate to state that some of these subspecies such as franciscana may not have some value as an ecologic form. Mr. W.J. Eyerdam writes as follows " I have about 1000 specimens of this exceedingly variable species. Several of these variations are entitled to names and the slender shells that are in the Princ Wm. Sound area might be described as a separate race. I can submit plenty of specimens from Knight Island to anyone desiring them for study. Professor Trevor Kincaid has a series of over 30,000 specimens of catalogued T. lamellosa and T. emarginata and photos and figures of a great many varieties and phases. Eventually it is hoped that this monograph will show all possible variations as well as habitats of these seemingly endless changes of form, color and size. Thais lapillus of both sides of the Atlantic and the shores of the Arctic is a near counterpart of T. lamellosa. Do these two species overlap somewhere in the Canadian Arctic ! I believe that Dall's varieties should stand, especially if they are distinct forms and a few others should also be named. This would help collectors recognize them more readily. A conchologist can easily recognize nearly all phases of T. lamellosa as belonging to a single species, but there are so many well defined varieties and the range of extremes is so great that it would simplify matters considerably to pin down all the outstanding races and varieties with a few more names."

However, the majority opinion is to follow Grant and Gale and place all of the varieties in the synonymy of the typical.

Collecting data: Port Orchard, Wash. (frilled and colored); Alki Point, Seattle, Wash.; De Poe Bay, Oregon; Crescent City, Calif. (high spired, no frills); San Francisco Bay (smooth) (Burch); " Not recorded from Monterey Bay or the Monterey peninsula, but reported by the Turvers to be common on the beach at the mouth of Scott Creek, 15 miles north of Santa Cruz. This may be the farthest south authentic record. I doubt if it lives as far south as Santa Barbara. If you throw out Dall's subspecies, I think you should also include franciscana." (A.G. Smith).

Mr. George Willett made the following penciled note following the list of species of T. lamellosa, and emarginata " We could continue naming varieties of Thais almost indefinitely. Although you list only one of T. lima there are numerous variants of this species that warrant names as much as those named in other species. I doubt that any of the named forms are true geographic races, and I would favor dropping all subspecific names in the group".

Therefore, we will simply list the subspecies below. It is our opinion also that they are of no systematic importance.

Thais lamellosa franciscana Dall,1915.	San Francisco, Bay.
Thais lamellosa hormica Dall,1915.	Inner Harbor at Sitka,Alaska
Thais lamellosa neptunea Dall,1915.	Cook's Inlet, Alaska
Thais lamellosa cymica Dall,1915.	Surf beaten rocks, off coast of Washington.
Thais lamellosa sitkana Dall,1915.	Inner Harbor, Sitka, Alaska.

Thais lima (Martyn),1784. Dr. A.M. Keen advises " The type locality for T. lima is King George's Sound, New Zealand. If Martyn's names are rejected T. lima may be credited to Gmelin,1790. Range: Kotzebue Sound, Arctic Ocean, south on the west to Bering Island, the Kuril Islands and northern Japan, on the east to the Aleutians, Monterey, and San Diego, Calif. and Cerros Island, Lower Calif. (Dall).

Collecting data: Port Orchard, Puget Sound; De Poe Bay, Oregon and Port Orford; Crescent City, Calif. (Burch); " We doubt the Monterey records of this species, and also the one from San Diego (A.G. Smith); Nunivak Island, and Pavloff B. (Lewis) (G. Willett); Mouth of Smith River,Calif. (Chace); Cape Perpetua,Oregon (Trethewey); Sitka, Alaska (Lowe); Puget Sound and Prince Wm. Sound and Kodiak Islands, Aleutian Islands, Alaska Penninsula and Kamchatka- coll by W.J. Eyerdam who makes the following comment " There are at least tyree distinct races showing but little variation between themselves. The Alaska penninsula and Aleutian variety at least as far as Atka Id. in the middle of the chain is a littoral race while the one I collected in Kamchatka in the Gulf of Kronotski is a heavy large form from sunken reefs below low tide with uniform shape." See Mr. Willett's note under previous species.

Thais canaliculata (Duclos),1832. The whole Aleutian chain, eastward to Sitka and southward to Monterey, Calif. (Dall) to Cayucos,Calif. (Burch). Type locality, California.

Collecting data: Port Orchard, Wash.; De Poe Bay and Port Orford,Oregon; Crescent City,Calif.; under Mytilus at Cypress Point, Monterey Co.,Calif. (Burch); nice set from Ketchikan,Alaska collected by Mr. G. Willett that are orange banded (Burch); " Typical canaliculata definitely does not extend down as far as Monterey and I have not seen specimens from the Mendocino coast. All Monterey records of this are for the subspecies compressa." (A.G. Smith); Puget Sound, Wash. and Afognak Id. and Shuyak Strait, Alaska showing several color phases collected by W.J. Eyerdam who makes the following comment " The Kodiak Island form is separable from the more southern forms. This one is probably the more typical."; Red Bluff Bay, Alaska (Stephens); Ketchikan (Willett); San Francisco, Calif. (Lowe);

Thais canaliculata compressa Dall,1915. Type locality, Monterey. and ranges at least south to Cayucos. The specimens listed above from Cypress Point are of this variety and were collected by Mrs. John Q. Burch. ; " common under the mussel beds at Point Pinos (A.G. Smith);

Thais canaliculata analoga (Forbes),1850. Type locality, California ??? " Dr. A.M. Keen comments on this "*T. analoga* was described from California? I agree with your ???" Mr. A.G. Smith has studied the variety and advises " Have not seen any specimens like the figure Dall has given. The figure he gives is for a shell from Lituya Bay, Alaska. At Union Landing (11 mi. N. of Ft. Bragg) and at the mouth of the Smith River in Mendocino Co. the Chaces found a form of *canaliculata* that approaches *analoga* in shape but does not have the intercalated ribs. Sculpture is finer and the ribs more frequent than for *compressa* from Monterey. I would say that *analoga* may possibly not have come from California, as stated by Forbes, and that Dall's citation of a figured shell from Lituya Bay perhaps fixes the type locality".

Thais emarginata (Deshayes),1839. Bering Island and the Okhotsk Sea on the west; on the east from Hagmeister Island , Bering Sea, and southward to California,Mazatlan, and Topolobampo,Mexico (Dall). Mrs. Oldroyd gave the type locality California but we are advised by Dr. A.M. Keen " *T. emarginata* was described from New Zealand, like so many other west coast forms".

Collecting data: It is amazing that we seem to have but two varieties of this species listed in Bull. 112. It is a very variable shell both as to shape and color. It is almost too common to list locality records- several localities around Puget Sound; Oregon coast; Crescent City, Calif.;Monterey; Cayucos; Morro Rock; Santa Barbara; Santa Monica; Pt. Firmin; San Pedro; Laguna Beach (Burch); " Have it all the way from Mazatlan, collected by Tremper, to Forrester Island, Alaska , collected by Willett " (A.G. Smith); Puget Sound, Prince Wm. Sound and Kodiak Islands collected by W.J. Eyerdam who comments as follows " In Puget Sound at Port Orchard, Kitsap Co., and at Zenith, King Co. I found red, orange,black,white,brown,spotted and alter--nate banded black and white and other combinations of color forms in the same colonies. In the Kodiak Islands I have found black,white and violet specimens. A hairsplitter could name dozens of color varieties if he were obsessed with the naming bug."; Point of Rocks, Lower Calif. (Stephens); Coronado jetty opposite Hotel (Bristol); San Diego (Kelsey); Rosarito Beach, L.C. (Trethewey); Point Loma (Lowe);

Thais emarginata ostrina (Gould),1852. Ellamar, Alaska to Point of Rocks, Mexico. Dr. A.M. Keen comments " My check list range 31 to 61 was based on specimens in Dr. Fred Baker's collection.."

Collecting data: We collected specimens fitting the description of this variety around Monterey, Calif. but doubt that it has any systematic significance (Burch); " a form normally found on wave-washed rocks along the ocean front. Very large specimens are found along the ocean face of the Monterey Peninsula (A.G. Smith); Golden Gate, Calif. (Hemphill); Trinidad, Calif. (Frank Stephens); Point of Rocks, L.C. (Kelsey); Alameda and Cypress Point, Monterey (Lowe)

Thais emarginata projecta Dall,1915. Dall listed this from Tillamook,Ore. but Keen Abridged Check List brings the range on south to San Francisco.

Collecting data: " Have not seen this from the San Francisco region. My *emarginata* from Land's End at the mouth of the Bay are rather small,smooth, chunky, and run a gamut of colors, many being pure yellow (A.G. Smith); Orcas Island (Oldroyd); Sitka,Alaska (Lowe); Ketchikan and Coco Harbor, Dall Island (Willett).

Subgenus *Stramonita* Schumacher,1817. Type (by sub. desig.Cossmann) Buccinum haemastoma Linnaeus.

Thais biserialis (Blainville),1832. Dall,1923 (Additions etc. to Bull. 112 listed this species from La Jolla. It does occur on the outer coast farther south and it is possible that a stray specimen might have reached La Jolla. But it is definitely not of the fauna north of San Diego.

The following keys and list of species from Mr. A.M. Strong's notebook will be of interest.

Genus

Shell without varices or axial ribs
. Outer lip with an anterior tooth or horn.............. Acanthina
. Outer lip evenly dentate or smooth
.. Columella with a single plication .... Cuma
.. Columella without a plication
... Spire evident, more or less prominent .... Thais
... Spire minute, body whorl limpet shaped .... Concholepas

Genus Acanthina

Surface more or less tuberculate
. Upper row of tubercles very prominent
Gulf of California to Peru .... tuberculata
Reeve, Monoceros, pl.2, fig5
. Several strong,tuberculate,scaly,spiral ribs
Length 65 mm. Gulf of California to Ecuador ...... muricata
Reeve, Monoceros, pl.2, fig.8
. Three rows of widely spaced white tubercles
Length 30 mm. Panama to Peru .... brevidentata
Reeve, Monoceros, pl.1, fig.4

Surface not tuberculate
. Whorls with a concave tabulation
.. Spiral cords large, entire surface scaly
Length 85 mm. Galapagos .... grande
Reeve, Monoceros, pl.2, fig.6
.. Spiral cords fine, more or less scaly
Length 55 mm. Chile to Patagonia .... calcar
Reeve, Monoceros, pl.3, fig.12
. Whorls strongly angulated
.. Surface with a network of fine lines
Length 26 mm. Gulf of California .... angelica
Nautilus, vol.32, p.26
.. Entire surface scaly
Puget Sound to San Diego .... spirata
Oldroyd, vol.2, pt.2, p.47
.. Body whorl smooth or nearly so
Puget Sound to San Diego.......................... spirata var. unicarinata
. Whorls rounded or slightly angulated
.. Surface nearly smooth
... Light colored with small, rounded dark spots
Monterey to San Tomas .... spirata var. punctulata
... Light lines between large, squarish, dark spots
15 mm. San Pedro to Cerros Island .... paucilirata
Oldroyd, vol.2, pt.2, p.48
.. Surface with 3 or 4 strong spiral cords
Length 50 mm. San Diego to Galapagos Islands ... lugubris
Oldroyd,2-2-48; Reeve,Monoceros,pl.3,f.7
.. Surface with scaly spiral cords or smooth, very thick
Peru to Magellan Strait......................... unicornis
equals crassilabrum Lamarck ; Reeve, Monoceros, pl.4, fig.14

Genus Thais

Columella broad, flattened or excavated
. Columella uniformly white or brownish
Length 25 mm. Panama to Peru .... callaoensis
Reeve, Purpura, pl.13, fig.79.
. Columella white, edges with red
Length 50 mm. Peru .... delessartiana
equals blainvillei Desh. Reeve, Purpura, pl.9, fig.41
. Columella uniformly orange red
.. Inside of outer lip uniformly chocolate brown
Length 75 mm. Peru and Chile .... chocolata
Reeve, Purpura, pl.5 5, fig.22
.. Inside of outer lip tinged with red
Length 75 mm. Gulf of Calif. to Chile .... columellaris
Reeve, Purpura, pl.2, fig.9
. Columella white, with an oblong black spot in the center
Length 60 mm. Lower California to Peru .... planospira
Reeve, Purpura, pl.3, fig.14
. Columella red with a brown area at the top
Length 100 mm. Lower Calif. to Peru .... patula
Reeve, Purpura, pl.2, fig.9
Columella not greatly flattened or excavated
. Sculpture not tuberculate
.. Sculpture of sharp spiral cords
... Cords on the shoulder of the whorls the most prominent
Length 50 mm. Bering Sea to Santa Barbara .... lamellosa
Oldroyd, vol.2, pt.2, p.42
... Spiral cords alternating in strength
Length 60 mm. Arctic Ocean to Cerros Island ...... lima
Oldroyd, vol.2, pt.2, p.44
... Spiral cords uniform, sharp,narrow
Length 30 mm. Bering Sea to Monterey .... canaliculata
Oldroyd, vol.2, pt.2, p.46
... Spiral cords roughened or subspinose
Length 30 mm. Bering Sea to Cerros Island ...... emarginata
Oldroyd, vol.2, pt.2, p.44
.. Sculpture of impressed spiral lines or grooves
Length 50 mm. Panama to Peru .... crassa
equals melo Desh. Reeve, Purpura, pl.4, fig.17
. Sculpture with small, subobsolete tubercles
.. Columella and interior of aperture orange red
Length 90 mm. La Jolla to Peru .... biserialis
equals bicostalis Reeve, Purpura, fig.28
.. Columella and edge of lip purple brown
Panama .... intermedia ,
equals hippocastanum Lam. Rve; Purpura, pl.8,fig.38,
Purpura,pl.11,fig.60
. Sculpture with sharp,pointed tubercles
.. With or 2 spiral rows of tubercles
... Surface with strong lamellae of growth and fine spiral striae
Length 60 mm. Magdalena Bay to Peru .... kiosquiformis
Reeve,Purpura, pl;7, fig.31
... Surface with fine, regular, spiral striae
Length 25 mm. Gulf of California to Peru .... triangularis
equals carolensis Reeve, Purpura, pl.11, fig.57

(con.)

.. With 3 rows of pointed tubercles
Length 35 mm. Gulf of California to Acapulco .... triserialis
equals speciosa Reeve,Purpura,11,fig.56

Family Thaisidae

Genus Thais Roeding,1798	
Subgenus Nucella Roeding,1798	
Nucella emarginata Deshayes,1839	Bering Sea to Mexico
Nucella lamellosa Gmelin,1792	Bering Sea to Santa Barbara
Nucella lima Martyn,1788	Arctics to Cerros Island
Subgenus Stramonita Schumacher,1817	
Stramonita biserialis Blainville,1832	La Jolla to Peru
Stramonita callaoensis Gray,1828.	Panama to Peru
Stramonita chocolata Duclos,1832.	Peru and Chile
Stramonita crassa Blainville,1832	Panama to Peru
Stramonita delessertiana d'Orbigny	Lower Calif. to Peru
Stramonita peruensis Dall,1909.	Peru
Stramonita triangularis Blainville,1832.	Gulf of Calif. to Peru
Stramonita triserialis Blainville,1832.	Gulf of Calif. to Acapulco
? Stramonita kiosquiformis Duclos,1832.	Magdalena Bay to Peru
Subgenus Purpurella Dall,1872	
Purpurella columellaria Lamarck,1822	Gulf of Calif. to Chile
Purpurella patula Linnaeus,1758.	Gulf of Calif. to Peru
Subgenus Tribulus Klein,1753	
Tribula planospira Lamarck,1822	Lower Calif. to Peru
Subgenus Thalessa H. & A. Adams	
Thalessa heptagonalis Reeve	Panama
Thalessa intermedia Kiener	Panama

Genus Acanthina Fischer,1807	
Acanthina angelica Oldroyd	Gulf of California
Acanthina brevidentata Mawe (Wood)	Panama to Peru
Acanthina calcar Martyn	Chile
Acanthina grandis (Gray) Sowerby	Galapagos
Acanthina lugubris Sowerby,1822	San Diego to Galapagos
Acanthina muricata (Gray) Broderip,1832.	Gulf of Calif. to Ecuador
Acanthina paucilirata Stearns	San Pedro to Cerros Island
Acanthina spirata Blainville,1832	Puget Sound to Cerros Island
Acanthina tuberculata Gray	Gulf of Calif. to Peru
Acanthina unicornis Brug.	Peru and Chile

Genus Cymia	
Cymia tectum Wood,1828	Panama to Ecuador

Genus Concholepas	
Concholepas loco Molino,1782.	Peru and Chile

Genus Acanthina Fischer de Waldheim,1807. Type (by subsequent designation, Gray,1847), Buccinum monoceros Chemnitz - Buccinum calcar Mart.

" Shell short, with small spire, large body whorl, and very short anterior canal; spiral sculpture usually present but varices and axial sculpture absent; aperture ovate, parietal wall usually with a delimited callus deposit, a projecting tooth present at some growth stages on anterior portion of outer lip" (Grant and Gale, p.719).

Subgenus Acanthina s.s.

Acanthina lugubris (Sowerby),1822. San Diego south to Panama and the Galapagos Islands. Type locality not given.

Collecting data: A very abundant species on the rocks around Todos Santos Bay especially those immediately north of Ensenada. Have never seen it from San Diego but there is no reason not to expect an occasional specimen when it is so common fifty miles to the south (Burch); " Have seen no shells of this species that were actually collected at San Diego (A.G. Smith); and the San Diego Museum of Natural History reports " All of our specimens are from Lower California and the Gulf."

Subgenus Acanthinucella Cooke,1918. Type (by original designation) Acanthina punctulata Sowerby.

Acanthina spirata (Blainville),1832. Puget Sound to San Diego and Socorro Island. Type locality: " Des iles Sandwich" (an error presumably based on a ballast shell) (fide Grant and Gale). We have so many of these erroneous type localities that it deserves an occasional comment. Dr. A. Myra Keen expresses the opinion of many in a brief note " Confidentially-- I don't see why ballasting is invoked so often to account for erroneous type localities. In those early days when ships called at many ports and exactitude of records seemed not very important anyway, why shouldn't many a mistake have been made ! Even in this enlightened age we sometimes mix labels."

Collecting data: Our experience has been to find this the most common of all gastropods from Monterey to San Diego. Common above high tide mark on pilings, rocks, floats etc. Mytilus beds inside and outside of the estuaries etc. We have labelled the sharply terraced specimens as the typical and the round form the variety.(Burch); not common in Monterey Bay. Would rate it scarce there (A.G. Smith); San Quintin and Todos Santos Bay, L.C. to Tomales Bay, Marin Co.,Calif. (San Diego Museum); Santa Rosa Island, Calif. (Fleming).

Acanthina spirata aurantia Dall,1908. This is the yellow albino form common enough in all colonies of the species. It is of no significance in my opinion. I have many specimens of exactly the same thing in other species such as the Acanthina lugubris if anyone cares to name a lugubris aurantia or citrica. (Burch); Laguna Beach (Lowe); Santa Monica (Clark).

Acanthina spirata punctulata (Sowerby),1835. Monterey, Calif. to San Tomas, Lower Calif. and Socorro. We have been labelling the round shouldered form with this name. Many local collections have it as A. lapilloides (Conrad)

Collecting data: Monterey, Calif.,very common; San Simeon,Calif. ,larger brownish specimens; Malaga Cove to Pt. Firmin along the Palos Verdes Estates; Laguna Beach; La Jolla; Rosarito Beach, L.C. (Burch); abundant in Monterey Bay, on rocks between tides (A.G. Smith); Piedras Blancas Light (Coss); Monterey (Hemphill); Cape Colnett, L.C.

Acanthina paucilirata (Stearns),1871. San Pedro, Calif. to Cerros Island, Lower Calif. Type locality, Coronado Islands.

Collecting data: This is the common form on the cliffs around La Jolla, Calif. and common all around San Diego. An interesting thing is that the specimens from Todos Santos Bay and Punta Banda and around to Arbolitos are very much larger than the La Jolla specimens (Burch); Rosarito Beach and Cape Colnett, Lower Calif.

Genus *Drupa* Roeding, 1798.

Dr. A. Myra Keen has stated the nomenclatorial data on this for us (Per. Comm. July,1945) " I agree that *Drupa* should be placed in the Thaisidae. According to my notions of classification, our west coast species belong to a subgenus of *Drupa* rather in *Drupa* s.s. Subgenus *Morula* Schumacher,1817. Type (orig. design.), *M. papillosa* Schumacher- *Drupa uva* Roeding. These are small shells, usually biconic, with nodose sculpture. The type of *Drupa* s.s. is (monotypy), *D. morum* Roeding- *Nerita nodosa* Linnaeus. This is the same biologic entity later named *Ricinula horrida* by Lamarck; the *Drupa uva* was named *Ricinula morus* by Lamarck."

" Animal and radula the same as in *Thais*. Shell ovate or subfusiform, solid; whorls tubercular, spinose, or longitudinally costate; aperture narrow, oblong, canaliculate above, with a short canal below; outer lip furnished with strong teeth within; inner lip wrinkled or plicated. Operculum oval,straight, with lateral nucleus." (Suter,1913,p.428).

Subgenus *Morula* Schumacher,1817.

Drupa lugubris (C.B. Adams),1852. Redondo Beach, Calif.(Burch) to Panama. Type locality, Panama.

Thomas A. Burch in Nautilus 54:46, pl.2, figs. 5,6,7 published an article announcing the addition tp the Californian fauna of this species. It was dredged off Redondo Beach, Calif. in 25 fathoms, gravel bottom. It was our opinion at the time that the species belonged to the genus *Cantharus*.

However, Dr. Jeanne S. Schwengel in Nautilus 56:77,78, pl.7, fig.7 described and figured *Drupa didyma* from the Atlantic coast being named for its resemblance to *lugubris* of this coast.

We are accepting Dr. Schwengel's advice that the species is properly placed in the genus *Drupa*.

It is rather surprising that this species has not been collected and reported before this time because it is by no means rare. We have probablty taken over 100 specimens. And it is not uncommon in some of the Pleistocene deposits such as the Baldwin Hills of Los Angeles county. The fossils had been rather generally confused with *Fusinus*.

It is interesting to note that Pilsbry and Lowe called this species *Latirus* and were followed by Maxwell Smith in Panamic Marine Shells who lists *Latirus lugubris* (C.B. Adams) under Fasciclariidae.

Additions and Corrections

The following data was received after publication and should supplement minutes #51. The notes are by Mr. A.G. Smith.

Trophon triangulatus Cpr.- Monterey Bay 20-40 fms.. on shale;rare. The best figure of this species is by Dall, Proc. USNM, v.14, no.849, pl.5, f.3,type specimen.

We are using the genus *Boreotrophon* and *Trophonopsis* but these additions will be stated asr received from Mr. Smith.

T. avalonensis Dall- We have not seen this from Monterey. If your spec- -imens are correctly named, this makes an addition to our Monterey list.

Note- the Burches listed this species dredged off Monterey but prefer to have our classification rechecked by Mr. Smith before adding or extending any list or range.

T. disparilis Dall- 40 fms. off Mendocino Co. coast. (CAS).

T. calliceratus (Dall)- A single specimen, 65-71 fms. off Pt. Pinos (USFC) may be this species although it resembles *T. triangulatus*, also.

T. bentleyi Dall- About 100 fms. off La Jolla.

T. lasius (Dall)- 152-495 fms. off Pt. Pinos (USFC); scarce.

(con.)

T. multicostatus (Esch.)- Reported by Cooper from Monterey but his record has not been confirmed by recent collecting.
T. smithi (Dall)- 46-71 fms. off Pt. Pinos (USFC); scarce. Beach at Pt. Pinos, a single specimen (A. Sorensen).
T. stuarti E.A. Smith- 202 fms. Monterey Bay (USFC); rare.
T. tripherus (Dall)- 581 fms. in Monterey Bay (USFC); rare.
T. peregrinus (Dall)- According to MacKenzie Gordon, who examined the type of both species in the USNM, this and triangulatus are the same and the former therefore goes into synonymy.

Family CORALLIOPHILIDAE

Genus Coralliophila H. & A. Adams.1853. Dr. A. Myra Keen states some of the problems involved in this group (Per. Comm. July,1945)-
" Genotype of Coralliophila H. and A. Adams,1853, is (subsequent designation, Cossmann,1903); Purpura neritoidea (Lamarck) = Pyrula neritoidea Lamarck--Murex neritoideus Gmelin (preoccupied by M. neritoideus Linne)= Purpura violacea Kiener,1836.

In other words, Lamarck's familiar name of neritoidea must fall as a homonym and the next available synonym must be adopted; namely, Coralliophila violacea (Kiener).

The genotype is a low spired with squamous sculpture throughout and with an open canal. For the keeled forms with fairly high spire and more or less regular spines at the shoulder the following subgeneric name seems appropriate:
Mipus De Gregorio,1885. Type (fide Dall,1902; apparently by monotypy); Trophon gyratus Hinds.

I notice that Tomlin,1935 (Jour. Conch., vol.20, pp. 180-183) places gyratus in Latiaxis and suggests that Latiaxis is doubtfully distinct from Coralliophila. In other words, he would lump Pseudomurex,Latiaxis,Mipus-etc. all in Coralliophila. I am wondering, however, if Latiaxis would not be appropriate for the two or three loosely coiled forms like the genotype L. mawae; Mipus for the tightly coiled, keeled forms; Pseudomurex for the high spired forms with corded rather than squamous sculpture; and Coralliophila s.s. for the low spired, squamously sculptured species. The type of Pseudomurex is bracteatus (Brocchi) (not braceatus, as Maxwell Smith records it.) "

I have on my table at this moment the genotype of Coralliophila, a large series of the local species we have been allocating to this genus, and several large sets of the Japanese species . The Japanese shells and ours are obviously related, but if there is any relationship between either of them and the globular,white with lavender aperture, Coralliophila violacea it is not to be observed in the shells. Hirase used the genus Latiaxis for the Japanese species resembling our Californian shells and Coralliophila for the others. I feel that Hirase was right and propose to use Latiaxis for our species. Having collected hundreds of these shells I know that there is certainly no coral connected with the habitat. They must have a very different ecology from the coral reef species. It is quite probable that our species should go into an entirely new or different genus, but it seems that they are at least much closer to the Japanese Latiaxis than they are to Coralliophila.

Latiaxis costata hindsii (Carpenter),1857. Point Conception to Panama. Type locality, Panama.

It is the personal opinion of John Q. Burch that the local species we have been dredging in large numbers off Redondo Beach,Catalina Island and elsewhere along the coast is hindii and that hindii is but a race of the older costata Blainville.

Maxwell Smith in his book " The Rock Shells",1939 figures a specimen under the name of Coralliophila.muricata (Hinds),1843, his number 490 and figured on pl.21,fig.13. Of course, muricata was described by Hinds under Trophon where the name was preoccupied by Montagu and Carpenter changed it to Trophon hindsii for that reason. Therefore, the species we should have as hindsii is the species described by Hinds in Voy. Sulphur,14,t.,1,f.16 and the southern California specimens compare very well with Hinds figures of which there are two. Maxwell Smiths figure mentioned above is obviously not a figure of Hind's type but is very obviously the same species we have under consideration. Smith also figures a specimen under the name of C. costata Blainville, pl.21,fig.3. If Smith's figure is correctly identified the relationship to hindsii is apparent. The range of costata is given by Smith as Catalina Island, Calif. south to Panama and the Galapagos, but the California record for typical costata is very questionable. However, all descriptions of costata indicate that it is very close to hindsii and as stated above it is the opinion of this writer that they are not specifically distinct.

J.R. le B. Tomlin " Catalogue of Recent Latiaxis", Journ. Conch. vol.20, no.6, pp.180-183,1935 lists these species questionably under that genus. The student of this group should consider Pseudomurex Monterosato with type Murex bracteatus Brocchi,1814. Maxwell Smith gives a figure of this species under the name braceatus in his " Rock Shells", pl.21,fig.6 but he states that the specimens came from off North Carolina and Florida. Brocchi's species was described as an Italian Tertiary fossil. The shell Smith figures is clearly close to the group being discussed. The type of Latiaxis Swainson, 1840 is L. mawae (Griffith and Pidgeon),1834. This is the extreme of the loosely coiled species. It is not too rare from Japan. Hirase figures it beautifully in his Japanese Shells,1934, pl.111, fig.2. L. pilsbryi Hirase is very similar to the type but Hirase also figures a number of other species on the same plate indicating the connection between the very loosely coiled species and the species such as japonica (Dunker). If the above conclusions are in error we will be pleased to have the matter explained. It is very obvious that there is a great deal of confusion in all west coast collections regarding these species. We will list the species described from this coast or rather the names in general use. Unfortunately the same species appers in different collections under several different names.

Coralliophila oldroydi Oldroyd,1929. Nautilus 42:98,99,1929, pl.5, figs. 1-4. Type locality: Bird Rock off Isthmus, Catalina Island. Range to Galapagos. The description follows:

" Shell large, heavy, aperture one half the length of the shell, with a row of horizontal scales on the shoulder, and four heavy spiral ridges below the shoulder on the body whorl. There are fine spiral ridges on all the whorls. Aperture of a greenish white, canal short. It differs from C. hindsii Carpenter, in having the shoulders nearly straight, and only a faint trace of scales where the body whorl joins the next one. The shoulders in C. hindsii are very sloping. Length of shell 47 mm."

" Named in honor of T.S. Oldroyd who collected it some 34 years ago. It has gone under the name of Coralliophila hindsii Carpenter."

Many of the correspondents of the Burches have this species or rather a species labelled with this name dredged off Redondo Beach, Calif. They were so labelled on the assumption that Mrs. Oldroyd figured very worn or dead shells plus some immagination. Our shells being pearfect specimens show frills,spines etc. We have changed the labels on our specimens to the name L. costata hindsii Carpenter. However, we are far from agreed on this practice. The following note from Dr. A. Myra Keen gives us some light (Per. Comm, July,1945) " After careful examination of the type material of *C. oldroydi* , I am inclined to reject it as a synonym of *C. hindsii* Carpenter. One of Mrs. Oldroyd's paratypes came from the Galapagos Islands. I had thought , from a preliminary study of material at the National Museum, that perhaps *oldroydi* would apply to the form with upcurved spines at the shoulder, *hindsii* to the form with spines slanting downward or outward, but this may be rather an arbitrary distinction. The holotype of *oldroydi* is not dead or worn, as you suggest, but is large and fully adult; young specimens in the type lot show numerous recurved spines. The type lot was collected by Mr. Oldroyd directly from the outer surf-beaten rocks of Catalina Island: he managed to reach the rocks from a row boat but nearly capsized in leaning over to pick the shells off."

Note- the last line of Dr. Keen's comment certainly indicates no coral habitat for these California species.

Coralliophila costata (Blainville),1832. San Miguel Island, Calif. to Panama. Type locality, Mazatlan,Mexico.

This name probably appears on more sets of our California specimens than any other. Mr. George Willett commented briefly on it " Doubtfully Californian". The Lowe collection in the San Diego Museum used this name entirely and listed the species from the following collecting localities: Tres Marias Islands,Mexico; Cape San Lucas; San Marcos Island,Gulf of Calif.; Conception Bay; Carmen Island, Gulf of Calif.; Mazatlan,Mexico; Catalina Island and San Clemente Island, Calif.; Coronado Islands, Mex.

Coralliophila kincaidi Dall,1919. This species was described from Puget Sound but is thought to be merely a specimen of *Ocenebra lurida* , and we propose to drop it from our faunal list. Dr. A. Myra Keen explains the matter (Per. Comm. July,1945) " Studying the holotype of *Coralliophila kincaidi* Dall at the National Museum, I came to the conclusion that it is an unusually well developed *Ocenebra lurida aspera* . There is a specimen of the latter in the Stanford collection that matches the holotype figure very well (Oldroyd, vol.2, pt.2, pl.30, fig.13); in the same lot are three other specimens with the characteristic closed canal of *Ocenebra*. Apparently Dr. Dall was led to make this allocation on the basis of the open canal of his specimen."

In the light of the above discussion the following key and list of species from Mr. A.M. Strong's notebook will be of particular interest.

Genus *Coralliophila*

Shell with distinct axial ribs
. Spiral sculpture of numerous fine striae
25 mm. Gulf of California to Panama .... *nux*
equals *Tritonalia parva* E.A. Smith Maz. Cat. #611
. Spiral sculpture of irregular, unequal spiral cords
.. Axial ribs about 9
30 mm. Puget Sound .... *kincaidi*
Oldroyd, vol.2, pt.2, p.50
.. Axial ribs about 16
23 mm. Lower California .... *stearnsiana*
Proc. USNM, vol.56, p.340 sp. 496, pl.21, fig.7
. A strong peripheral and numerous secondary cords
22 mm. Magdalena Bay .... *orcuttiana*
Proc. USNM,vol.56, p.339; sp.492, pl.20,fig.21

. Spiral sculpture of numerous rows of erect spines
Peru .... *cardua*
Reeve,Murex, vol.28, p.125

Shell without distinct axial ribs
. Shell with distinct spiral keels
.. Shoulder with a strong tuberculate keel
32 mm. San Miguel Island to Peru .... *costata*
Maz. Cat. #610; sp. 480, pl.21, fig.3.
.. Shoulder with flat, horizontal spines
... Body whorl with a second row of spines
17 mm. Panama .... *hindsii*
Reeve, Murex, 31-147; sp. 490,pl.21, fig.15
... Body whorl with 4 strong spiral cords
47 mm. Catalina Island .... *oldroydi*
Nautilus 42:98
.. Whorls with several, irregular, sharp keels
Ecuador .... *scalariformis*
Reeve, Purpura, 13-75; sp. 495, no figure
. Shell with fine spiral striae only
.. Columella flatly depressed
30 mm. South Pacific .... *monodonta*
Tryon, vol.2, p.212 as *madreporarum*

Genus *Coralliophila*

Coralliophila oldroydi Oldroyd,1929.	Catalina Island and Galapagos
Coralliophila costata (Blainville),1832.	San Miguel Island to Peru
Coralliophila orcuttiana Dall,1919.	Magdalena Bay
Coralliophila stearnsiana Dall,1919.	Lower California
Coralliophila nux Reeve	Gulf of Calif. to Panama
Coralliophila hindsii Carpenter,1856	Panama
Coralliophila scalariformis (Lamarck),1822	Ecuador
Coralliophila cardua (Broderip),1832	Peru. Gulf of California.

Genus *Quoyula*

Quoyula monodonta (Q. & G.),1832	South Pacific

Genus *Coralliobia*

Coralliobia fimbriata A. Adams	Panama

Family EPITONIIDAE

We are following the great majority of modern authors in the use of the above family name. However, there are a number using the name Scalidae . Theile in " Handbuch der Systematischen Weichtierkunde",1929, p.222 uses Scala (Klein 1753) Bruguiere,1792. Dr. Joshua L. Baily Jr. gives us some discussion of this problem (Per. Comm. Aug.,1945) " In response to some of the questions raised by your last communication dealing with Epitonium, Janthina, and Eulima and their families there is much to be said. First, you will notice that Theile uses the name Scala instead of Epitonium .Scala was originally used by Klein, a pre-linnean author. The International Commission on Zoological Nomenclature has ruled that pre-linnean names are available only when validated by a post-linnean writer. In this case Bruguiere used the name in 1792, according to Theile. But the use of a name does not necessarily validate it. The later author must adopt it. If he merely quotes it in synonymy he does not validate it. I do not have a copy of Bruguiere, but it seems to me that if he merely copied this name in the synonymy of some other name that other name would be the one to use.(unless it had already been used in some other sense), but as no other name has ever been used until Bolton suggested Epitonium in 1798 it looks to me as if Scala had been adopted and therefore validated by Bruguiere. But I have not seen a copy of Bruguiere and would not wish to suggest the use of a name that has been discarded by practically everyone I know, but I do feel that the question is not yet settled, and cannot be without consulting Bruguiere."

The following key to genera of the family Epitoniidae will be of interest. Reference, Durham in Journal of Paleontology, vol.11,pp.483-484.

Key to the Epitoniidae

True varices present .... Epitonium
. Spiral ribs present
.. Basal disk present
... Surface of varices covered by network of crossed
    spiral lines producing a decussate appearance....(Crisposcala)
.... Surface of varices not so covered
..... Body whorl very large, spire low ....(Sthenorytis)
..... Body whorl not large, spire high
...... Basal disk boned by a continuous keel,varices simple..(Boreoscala)
...... Basal disk not bounded by a continuous keel but by
    short triangular posterior enlargements of varices..(Cirsotrema)
.. Basal disk absent .... (Asperiscala)
. Spiral ribs absent
.. Basal disk present ....(Gyroscala)
.. Basal disk absent
... Varices continuous over all whorls .... (Clathrus)
... Varices not continuous from whorl to whorl .... (Nitidiscala)
Varices absent;(true axial ribs present)
. Outer lip not sharp
.. Axial ribs passing onto the basal disk .... Acrilla
... Axial ribs usually not as heavy as spiral ribs; when
    they are as heavy they simulate varices ....(Ferminoscala)
... Axial ribs heavier than spiral ribs,not varix-like..(Unidiscala)
.. Axial ribs not passing onto the basal disk .... Opalia
... Only very fine spiral striations present
.... Suture deep and with a sharp angulation just below it,
    crenulated by upper margin of ill-defined axial ribs..(Dentiscala)
.... Suture moderately deep, without sharp angulation.....(Opalia s.s.)

(con.)

... Spiral ribs present
.... Distinct perforations in interspaces between ribs .....(Nodiscala)
.... Perforations not present
..... Basal keel visable in the suture
...... Axial ribs continuous from suture to suture........ (Confusiscala)
...... Axial ribs not continuous from suture to suture ....(Claviscala)
..... Basal keel not visable in the suture .... Rugatiscala
. Outer lip sharpened, shell heavy .... Acirsa

The following key from Mr. A.M. Strong's notebook is of value.

Genus Epitonium Subgenera
Shell with a basal disk bounded by a keel
. Surface with a spongy, punctate outer layer
.. Varices faint over whorls, pointed in the sutures... Nodiscala
.. Varices strong over entire surface of whorls .... Cirsotrema
. Surface with a thin, chalky outer layer
.. Varices partly obsolete,surface pitted.............. Dentiscala
. Surface without a distinct outer layer
.. Spiral sculpture distinct
...Shell white
.... Varices terminating at the basal keel .... Punctiscala
.... Varices extending to the umbilical region .... Boreoscala
... Shell yellow or brown
....Sculpture evenly reticulated .... Ferminoscala
.... Occasional ribs strongly varicose .... Pictoscala
.. Spiral sculpture very fine or wanting
... Axial ribs strong and thick .... Opalia
Shell without a basal disk
. Spiral sculpture distinct
.. Varices forming a ridged fold bounding umbilicus....... Crisposcala
.. Varices rounding into umbilical region ....Asperoscala
. Spiral sculpture very fine or wanting
.. Shell distinctly banded with brown .... Hirtoscala
.. Shell white
... Shell slender,turrited .... Nitidiscala
... Shell short and broad
.... Varices thin and erect .... Globoscala
.... Varices thick and reflexed ....Sthenorytis

Genus Opalia H. and A. Adams,1853. Type (by subsequent designation, DeBoury,1886), Opalia australis (Lamarck).

Grant and Gale state " The species of the subgenus Opalia are higher spired and more tightly coiled than those belonging to the typical subgenus of Epitonium. They also possess a basal carina. The type E. australe is remarkably similar to E. wroblewski (Morch)."

We are not all in accord with giving Opalia generic standing. Dr. Joshua L. Baily Jr. states " Personally, I do not feel that Opalia is distinct enough to be made a genus, but if it is made a genus then Dentiscala should be made a subgenus of it rather than of Epitonium". However, Dr. A. Myra Keen advises " Opalia seems to me to be a good genus". George Willett commented " Most careful students of the group appear to use Opalia as a genus." Mr. A.G. Smith writes " Think Opalia should be considered a good genus and am so using it."

Opalia wroblewskii (Morch),1876. Vancouver Island to Forrester Island, Alaska. Reference for this range,Strong,Nautilus 51: 1937. Type locality

Vancouver Island, B.C..
Collecting data: Forrester Island, Alaska (G. Willett)

Opalia chacei Strong,1937. Nautilus 51:4,5, pl.2, fig.9. Type locality, Crescent City, Calif. Range, De Poe Bay, Oregon (Burch) to Catalina Island, Calif.

Inasmuch as the original description of this species is not in Oldroyd we reprint it here--" Closely related to the preceding species (wroblewskii) and in some collections confused with it, is a more southern shell which is somewhat smaller,heavier, and proportionately broader. The eight heavy varices continue over the body whorl to the well-defined basal disk at all stages of growth, and the punctation of the outer layer of the shell is distinct in well preserved specimens. This may take the name of Opalia chacei The type, No. 1045, in the collection of the Los Angeles Museum, Los Angeles California, was collected by E.P. and E.M. Chace at Crescent City, Calif. It measures: length 28.3, maximum diameter 11.1 mm. Additional specimens were collected by Mr.and Mrs. Chace at Crescent City&on the coast of Mendocino county, Calif. The writer has collected specimens at Half Moon Bay, near San Francisco, and Mr. George Willett has dredged a specimen off Catalina Island.

The type of Opalia is given by DeBoury as Scala australis Lamarck , Recent, Australia and is well figured by Reeve. It is quite similar to O. chacei, having similar heavy varices and basal disk bounded by a cord. An examination of a fresh specimen in the collection of H.N. Lowe shows definite indications of a similar punctate outer layer on the upper whorls. It would seem that this punctate outer layer should be considered one of the important systematic characters."

Collecting data: De Poe Bay, Oregon; Crescent City, Calif.; Cayucos, Calif.; dredged in 20 fms. off Monterey,Calif. (Burch); 1 specimen off Catalina Island in 50 fms. approaching wroblewskii (G. Willett); " we rate it scarse in Monterey Bay. Have it from several points along the Mendocino Co. coast (A.G. Smith); " rare on shore at Monterey" (Chace).

Opalia evicta (de Boury),1919. Forrester Island, Alaska to Magdalena Bay, L.C. Type locality, Neah Bay, Washington.

Mr. A.M. Strong mentions the possibility that this name must fall into the synonymy of O. montereyensis (Dall),1907. Reference Nautilus 51:6. Mr. A.G. Smith advises " I mention this species first as I suspect that O. evicta (de Boury) is a synonym. Based on 2 specimens from 25 fathoms off Del Monte, in mud, dredged by Berry. I believe both of these shells are in the USNM. Maybe Bartsch or Rehder would compare the two species and tell us whether theyare different."

However, the name evicta is in general use at this time, and we do not suggest a change until the above comparison may prove it necessary.

Collecting data: off Monterey in 10 fms.; Avalon,Catalina Island in 35 fms.; Redondo Beach in 25 and 35 fms. gravel; off Newport Bay, Calif. (Burch); Monterey Bay, beach drift to 35 fms., scarce (A.G. Smith); Forrester Island,Alaska,Cayucos,Calif. and San Pedro (G. Willett);

Opalia montereyensis (Dall),1907. Monterey to San Pedro, Calif. Type locality, off Del Monte, Calif. in 25 fms. See discussion under preceding species.

This species was described under subgenus Cirsotrema. Discussed by Strong in Nautilus 51:6,7,(1937).

We will tentatively place Opalia tremperi Bartsch,1927 under Epitonium subgenus Nodiscala.

Subgenus Dentiscala De Boury,1886. Type (by monotypy): Opalia (Dentiscala) crenata (Linne).

Having decided to give generic rank to Opalia it follows that the subgenus Dentiscala should be treated as a subgenus of Opalia rather than Epitonium. Dr. Joshua L. Baily Jr. expressed his opinion in our discussion under Opalia. Mr. George Willett briefly noted " I think nearer Opalia." Mr. A.G. Smith commented " Seems to me this falls more naturally under Opalia than under Epitonium."

The following key to the species of the subgenus Dentiscala is from Mr. A.M. Strong's notebook.

9 varices, basal disk with a coarse spiral rib
  6 whorls (decollated) 13.5 x 6 mm Gulf of Calif. ..... crenatoides
Cal Acad. 19-4-47
12 varices, basal disk smooth,convex
  7 whorls (decollated) 17 x 7 mm. Monterey to Mexico.. insculpta
12 varices, sharp spiral sculpture present
  6 normal whorls 10.5 x 5 mm. Catalina Island .... nesiotica
Oldroyd, 2-2-53

Opalia insculpta (Carpenter),1864. (E. crenimarginatum Dall,1917) Reference, Nautilus 52:10 by G. Willett. Opalia insculpta was described from the Pleistocene of Santa Barbara. Dr. Dall stated in describing crenimarginatum that it differs by having fine spiral surface sculpture. Mr. A.M. Strong states that the fine sculpture would be lost during fossilization, and therefore we should use Carpenter's fossil name for our Recent species.

Range: Monterey? to Puerto Libertad, West Mexico. Mr. A.G. Smith comments " We seriously question Dall's Monterey record."

Collecting data: This is no doubt our most common littoral species of this genus. Can it be possible that this species is generally commensal with the large green sea anemone, Cribrina xanthogrammica (Brandt) ? Our experience has been to usually find these Opalias near the base of the sea anemone. It is useless to list stations for such a common species which is abundant in our experience from Santa Monica,Calif. to Punta Banda,Mex. (Burch); Panama to Redondo Beach on sets in the San Diego museum; uncommon on the breakwater fronting the Coronado Hotel,San Diego; rare at Decenso, L.C.; uncommon in the rocks at Point Loma (W.K. Emerson); Santa Cruz Island, Calif. (G. Willett); Mrs. E.P. Chace calls attention to the fact that this species cannot be dropped into alcohol or preservative when taken because of the habit of throwing off purple dye that will stain the shells .

Opalia nesiotica (Dall),1917. Type locality, Catalina Island in 16 fms. and apparently known only from the type locality.

Opalia crenatoides (Carpenter),1864 is from the Gulf and listed in Mr. Strong's key above.

Genus Epitonium Roeding,1798. Type (by subsequent designation,Suter, 1913), Turbo scalaris Linnaeus (plus Scalaria pretiosa Lamarck).

" The section Epitonium s.s. which embraces large species with loosely coiled whorls and detached peristome, is not found fossil or living in America" (Woodring,1928).

Subgenus Nodiscala De Boury,1890. Type (by original designation) Nodiscala bicarinata (Sowerby).

" Shell small, slender, suture serrate; basal disk poorly developed; peristome complete,thick; sculpture consisting of obscure axial ribs and of spiral grooves; body whorl with two heavy spiral ridges, the lower one of which seems to limit the basal disk." (After Woodring) (Grant and Gale)

The following key and list of species of Nodiscala is from Mr. A.M. Strong's notebook. We will then take up a detailed discussion of the species in our fauna north of San Diego.

Subgenus Nodiscala

8 varices
9 whorls 9 x 3 mm. Oregon to Monterey .... spongiosa
Oldroyd 2-2-53

9 varices
7 whorls 1 x 4 mm. Acapulco .... mexicana
Proc. USNM 34-250

10 varices, fine axial ribs in interspaces
8 normal whorls 13 x 5.8 mm. Gulf of Calif. .... golischi
Cal. Acad/ 19-4-44

12 varices
9 whorls 10.5 x 3.5 mm. San Juan del Sur .... sanjuanense
Nautilus 45:115

14 varices, entire surface finely reticulate
7 whorls 7 x 2.5 mm. Catalina to Gulf of Calif. ... retiporosa
Cal. Acad. 19-4-45

15 varices, 10 to 20 threads
7½ whorls 6 x 2.3 mm Gulf of Calif. .... espirita
20 faint varices Mazatlan ....mazatlanica
26 faint varices San Clemente .... tremperi

Epitonium spongiosum (Carpenter),1864	Oregon to Monterey
Epitonium retiporosum (Carpenter),1864	Catalina to Gulf of Calif.
Epitonium mexicanum(Dall)1908	Gulf of California
Epitonium mazatlanicum(Dall)1908	Gulf of California
Epitonium espiritum B. H. & S., 1930	Gulf of California
Epitonium golischi B. H. & S. 1930	Gulf of California
Epitonium sanjuanense Lowe	Nicaragua
Epitonium ordeanum Lowe	Nicaragua
Epitonium tremperi (Bartsch),1927	San Clemente Island

Epitonium tremperi (Bartsch),1927. Proc. USNM, vol. 70, art.11, p.3, pl 1,fig.8. Discussed by Strong in Nautilus 51:7,1937. This species was described by Bartsch as Opalia tremperi. Type locality, on rocks at San Clemente Island and known only from type locality. However, Dr. A.M. Keen advises " A specimen in the Stanford collection was taken by W.G. Hewatt in 2-3 fathoms off Santa Cruz Island.

Epitonium spongiosum (Carpenter),1864. (Epitonium retiporosum (Carpenter)
Off Oregon coast in 50 fms. to Gulf of California. Type locality, Monterey, Calif.

This species and retiporosum , with type locality off Catalina Island in 40 fathoms, has been the subject of frequent discussion through the years. We have dredged them in large numbers from both type localities and insofar as we can see they are identical. When we presented this problem with the specimens to Mr. George Willett several years a go he replied as follows which

(See Page 21 for another key to Nodiscala)

was published in our Minutes #20, p.13, Feb.1943 " Your Epitonium spongiosum Carpenter are surely the same as all of my southern California specimens that I have been calling E. retiporosum . Perhaps the latter is a synonym of the former, which comes first on the page. If theyare the same, I have no idea what retiporosum is. I am inclined to believe they are identical and have changed my labels to E. spongiosum." Mr. A.G. Smith states " We rate retiporosum as a synonym. All specimens of this Nodiscala I have seen from California are one species, not two. Note you rate spongiosum as " common" in Monterey Bay. We rated it as rare, having taken only three or four specimens."

Collecting data: Common off Monterey on the shale off Del Monte in from 10 to 40 fathoms, also a common species off Redondo Beach, Calif. in 25 fms. and off Avalon, Catalina Island in 25 and 35 fathoms.(Burch); San Pedro in 20 fms.; Catalina Island in 30 fms.; Newport in 35 fms.(Willett); South Island, Los Coronados Islands,Mexico in 8 fms. (Baker); San Pedro Calif. in 30 fms. (Lowe); as retiporosum , Guaymas,Sonora,Mexico in 20 fms. and off Catalina Island in 50 fms. (Lowe).

Mr. A.M. Strong lists two subgenera here not represented in our California fauna.

Subgenus Punctiscala
8 varices
6 whorls 4.1 x 1.5 mm. Mazatlan .... carpenteri
Epitonium carpenteri Tap.-Caf. Gulf of California

Subgenus Pictoscala
18 minor varices, 1 or 2 major
7 whorls 10 x 4.5 mm. Panama .... purpuratum
Proc. USNM, 53:477
Epitonium purpuratum Dall,1917 Panama

Subgenus Acirsa Morch,1857. Type (by monotypy): Scalaria borealis Lyell. " Outer lip sharpened, shell heavy".

Epitonium boreale (Lyell),1842. Aleutian Islands, Alaska. Circumboreal. Johnson gives it from 'Greenland'. Figured in Oldroyd.

Dr. A. Myra Keen discusses this species (Per. Comm. Aug.1945) " The status of this name was discussed by Dall in 1889 (Bull. Mus. Comp. Zool. vol.18,p.308) who concluded that it was a synonym of the prior E. costulata (Mighels). However, as the latter is a homonym, boreale will stand. The reference cited in Bull. 112 and by Mrs. Oldroyd is defective. It should be: Scalaria borealis Lyell,1842 (Trans. Geol. Soc. London, ser.2,vol.6,p.136), based on an unnamed figure in Philosophical Trans.1835, pl.2,figs. 11,12. Type locality: fossil,(probably Pleistocene), Beauport,near Quebec. The exact date of Lyell's paper is uncertain; it probably is 1842, as that is the date of the title page; definitely it is not 1839, which is the date of the reading of the paper. Lyell implies but does not definitely state that Beck supplied the name; but according to the International Rules, Lyell must be considered the author."

Epitonium boreale ochotense (Middendorff),1849. Arctic near Bering Strait, Bering Sea and the Okhotsk Sea (Dall). Type locality, south coast of the Sea of Okhotsk.

Mr. Strong lists a species of this subgenus from the southern fauna.
Epitonium (Acirsa) exopleura Dall,1917. Cape San Lucas
Faint indications of axial sculpture only
7 Whorls 3.6 x 2 mm

Key to Species of Nodiscala (A.M. Strong)

Basal disk distinct
. Coronating points 8-9
.. Basal disk margined by swellings on the ribs
9 whorls 11 x 4 mm. Acapulco .... mexicana Dall
..Basal disk marginated by a series of pits
9 whorls 13 x 5.8 mm Gulf of California .... golischi B,H. & S.
. Coronating points 14
7 whorls (decollated) 7 x 2.5 mm. Catalina to Gulf of Calif. retiporosa
Basal disk indistinct
. Swollen varices present in addition to axial ribs
.. Axial ribs indistinct over the body of the whorls
7 whorls (decollated) 7.8 x 2.5 mm. San Clemente Id. ...... tromperi Bart.
.. Axial ribs strong over the body of the whorls
9 whorls 10.5 x 3.5 mm/ San Juan del Sur .... sanjuanense Lowe
. Swollen varices absent
.. Axial ribs indistinct over the body of the whorls
... Coronating points 8
9 whorls 9 x 3 mm. Monterey .... spongiosa Carpenter
... Coronating points more than 8
.... Coronating points 14-15
7 whorls (decollated) 6 x 2.3 mm. Gulf of Calif. .. espirita B.H. & S.
.... Coronating points 20
7 whorls 12 x 4 mm. Gulf of California .... mazatlanica Dall
.. Axial ribs strong over the body of the whorls
9 whorls 7 x 2 mm. San Juan del Sur .... ordenada Lowe

The above species have been described as Nodiscala , the type of which is Scala bicarinata Sowerby from the Philippines. This seems to be quite different from our shells.

Our shells seem to form a distinct group on the west coast; characterized by the coronating points in the suture, fine punctate sculpture and the thickened outer lip. However, they may have the basal disk present or absent and the swollen varices present or absent. In both my key to genera and subgenera and the one prepared by Durham the basal disk is a major character. Either these keys will have to be altered or this group broken up and distributed in other subgenera. In any case a different subgeneric name is needed.

Mr. Strong lists the following species in subgenera not represented in our fauna.

Subgenus Ferminoscala	
Epitonium ferminianum Dall, 1908	Gulf of Calif. to Panama
Epitonium brunneopictum Dall, 1908	Cerros Island
Epitonium pomphyolayx Dall, 1889	Cape San Lucas to Galapagos
Subgenus Sthenorytis	
Epitonium turbinum Dall, 1908	Galapagos

****

Subgenus Boreoscala Kobelt, 1902. Type Epitonium greenlandicum (Perry) " Shell usually white, with a basal disk bounded by a keel and both spiral and axial sculpture present" Arctoscala Dall, 1908 and Liroscala De Boury 1909 are synonyms. Fide Grant and Gale, 1931, p.856.

Epitonium greenlandicum (Perry) ,1811. Arctic Ocean near Pt. Barrow and southward on the west to northern Japan; on the east to Wrangell, Alaska. Circumboreal. Also Pliocene.(Dall). Johnson give the Atlantic range "Greenland to off Block Island, R.I., 10-109 fms." Type locality, Greenland.

Collecting data: Umnak and Unimak Ids., dead on beach (Willett).

Subgenus Asperiscala De Boury, 1909. Type (by original designation), Scalaria bellastriata Carpenter.

" Shell without basal disk or carina; spiral sculpture present, axial lamellae somewhat spiny or angular at the shoulder".

We will give the key and list of species covering the coast from Mr. A.M. Strong's notebook and follow with the discussion of our species.

Asperiscala
Varicose ribs with a spine or expanded angle at the shoulder
. Varicose ribs 15 to 16
.. Spiral sculpture sharp over entire surface
  7 whorls 17.5 x 10 mm. Monterey to San Diego .... bellastriata Cpr.
. Varicose ribs 18
.. Spiral striae absent near the suture
  8 whorls (decollated) 12.5 x 6 mm. La Paz .... pacis Dall
.. Spiral threads irregular, showing faintly on ribs
  8 whorls (decollated) 11.9 x 5.5 mm. Gulf of Calif. ..kelseyi B.H.& S.
. Varicose ribs 20 to 21
.. Spiral threads very close and fine
  5 whorls (decollated), 4.5 x 2.5 mm. La Paz .... imperforata Dall
. Varicose ribs 26 to 27
.. Spiral threads sharp, close
  5 whorls (decollated) 7 x mm. Catalina .... lowei Dall
Varicose ribs without spine or angulation at the shoulder
. Varicose ribs 6
.. Spiral threads on base only
  6 whorls (decollated) 8 x 5 mm. Magdalena Bay.... canna Dall
. Varicose ribs 10 to 12
.. Spiral sculpture of fine striae
... Varicose ribs slightly reflected, wider in suture
  6 whorls (decollated) 7 x 3 mm. Magdalena Bay .... tinctorum Dall
... Varicose ribs rather low, sharp, errect
  8 whorls, 6 x 3 mm. Panama .... zetoki Dall
.. Spiral sculpture of raised threads
... Varicose ribs nearly encircling the spire
  5 whorls (decollated) 5 x 2.5 mm. La Paz-Acapulco..acapulcana Dall
... Varicose ribs about half encircling the spire
.... Varicose ribs rather solid, smooth
  8 whorls (decollated) 9.5 x 4 mm. San Diego to Gulf.. cookeana Dall
.... Varicose ribs low, thin, sharp
  7 whorls (decollated) 5.5 x 3 mm. Cape San Lucas .... xantusi Dall
. Varicose ribs 13 to 14
.. Spiral sculpture of fine striae
... Varicose ribs feeble on upper whorls
  8 whorls (decollated) 14 x 5.5 mm. San Pedro .... arnoldi Dall
.. Spiral sculpture of strongly incised lines
... Varicose ribs thin, strongly reflected
  10 whorls, 4.3 x 2 mm. Taboga Island .... slevoni S. & H
Varicose ribs without spine or angulation at the shoulder
. Varicose ribs 13 to 14
.. Spiral sculpture of raised threads
... Varicous ribs continuous
  8 whorls (decollated) 10 x 4.5 mm. Magdalena Bay ... keratia Dall
... Varicose ribs not continuous, sharp
  4½ whorls.(decollated) 3.5 x 1.7 mm. Galapagos .... emydoneda Dall

(con.)

• Varicose ribs 16

•• Spiral sculpture of fine striae and a peripheral thread
6 whorls (decollated) 7.5 x 3.5 mm. .Laguna.Beach ..... lagunarum Dall

•• Spiral sculpture of evenly spaced threads
9 whorls, 3.7 x 1.4 mm. Manzanillo

• Varicose ribs 19-20

•• Spiral sculpture of uniform, fine threads
6 whorls 3 x 1.5 mm. Panama Bay .... onchodes Dall

Epitonium bellastriatum (Carpenter),1864	Monterey to San Diego
Epitonium lowei Dall,1906	Catalina
Epitonium cookeanum Dall,1917	San Diego to Gulf of Calif.
Epitonium lagunarum Dall,1917	Laguna
Epitonium arnoldi Dall,1917	San Pedro
Epitonium keratium Dall,1917	Magdalena Bay
Epitonium tinctorum Dall,1917	Magdalena Bay
Epitonium cannum Dall,1919	Magdalena Bay to Gulf of Calif.
Epitonium xantusi Dall,1917	Cape San Lucas to Tres Marias Ids.
Epitonium pacis Dall,1917	La Paz
Epitonium imperforatum Dall,1917	La Paz
Epitonium acapulcanum Dall,1917	La Paz to Acapulco
Epitonium kelseyi B. H. & S.,1930	Gulf of Calif.
Epitonium indistinctum (Sowerby),1844	Gulf of Calif.
Epitonium onchodes Dall,1917	Panama
Epitonium emydonedum Dall,1917	Galapagos
Epitonium sleveni S. & H.	Taboga Island
Epitonium zeteki Dall	Panama

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Epitonium bellastriatum (Carpenter),1864. Monterey to Todos Santos Bay, Mexico (Burch). Type locality, Monterey

Collecting data: In our experience this is one of the more common dredged forms. Common off Monterey on the shale in 10 to 20 fms.; common off Redondo Beach from 25 fms. down to 75 fms.; off Santa Monica in 15 fms ; off Ensenada,Mexico in 36 fms. A common Pleistocene fossil in many deposits such as Timm's Point, Baldwin Hills etc. (Burch); Monterey Bay, 10-25 fms in fine sand and shale fragments, fairly common (A.G. Smith); San Diego and Ocean Park (Baker); South Island, Los Coronados, 10-18 fms. (Baker); Newport and Long Beach (Lowe);

Epitonium lowei (Dall),1906. Catalina Island to San Diego. Type locality, off Avalon, Catalina Island, Calif. Dr. A.M. Keen advises that Kelsey dredged this species off San Diego in 40 fms.
Mr. A.M. Strong dredged it off White's Landing, Catalina Island in 30 to 40 fms.

Epitonium cookeanum (Dall),1917. San Diego to the Gulf of California. Type locality, San Diego, Calif.
Epitonium arnoldi (Dall),1917. San Pedro, Calif.
Epitonium lagunarum (Dall),1917. Laguna Beach,Calif.
The last two species are apparently known only from the types.

Subgenus Nitidiscala De Boury,1909. Type (by original designation), Scalaria unifasciata Sowerby.

• Shell small, rather slender, turretted, without a basal disk; axial sculpture consisting of strongly reflected retractive axial ribs fused across the sutures; spiral sculpture absent."

Reference- Strong, A.M., Trans. San Diego Soc. Nat. Hist. vol.6, no.7, pp. 183-196, pl.20.

A little note on spelling may be of interest. Dall in Bull. 112 and others have used the spelling Nitidoscala,Asperoscala etc. Dr. A.M. Keen advises on this " The original spelling is Nitidiscala. However, even the French are'nt consistent. French names beginning with de are spelled with the small letter only when the first name is given , as Alcide d'Orbigny. Otherwide D'Orb."

We will again give the keys and lists of species from Mr. A.M. Strong's notebook and then take up a discussion of our species.

Nitidiscala. Alaska to San Diego

Varicose ribs with a spine or expanded angle at the shoulder
. Varicose ribs 10 to 12
.. Shell white, with a brown band in suture
8 normal whorls 12 x 5.5 mm. Monterey to San Diego .... tincta
.. Shell uniformly white
... Varicose ribs continuous over the very deep sutures
8 normal whorls 20 x 8 mm. Monterey to San Diego .... cooperi Strong
... Varicose ribs sharp. not continuous over the sutures
6 normal whorls 6.5 x 3 mm San Diego .... orcuttiana Dall
. Varicose ribs 13 to 14
.. Varicose ribs broadly reflected over the body of the whorl
... Varicose ribs flattened in the sutures
7 normal whorls 12 x 4.5 mm. Catalina Island ...... catalinae Dall
... Varicose ribs continuous over the sutures
6 whorls (decollated) 9.5 x 5 mm. Puget Sound ..... caamanoi Dall & B.
.. Varicose ribs sharp, only slightly reflected
... Varicose ribs narrowly aculeated at the shoulder
11 whorls 35 x 12 mm. Alaska to Puget Sound .... indianorum Carpenter
... Varicose ribs expanded in to a small lamella at the shoulder
9 normal whorls 20 x 6.5 mm. Monterey to San Diego ... acrostephana
. Varicose ribs 15 to 16
.. Varicose ribs regularly continuous up the spire
10 whorls 17.5 x 4.5 mm. Monterey .... crebricostata
.. Varicose ribs concave at the suture, flattened on the base
12 normal whorls 18 x 7.5 mm. San Pedro to Coronado Island.tabulatum
. Varicosa ribs more than 16
.. Varicose ribs low, sharp, spinose at the shoulder
10.5 x 4 mm. Vancouver to Lower Calif. .... sawinae Dall
.. Varicose ribs sharply angulated to the shoulder
7 normal whorls 9 x 4 mm Pt. Reyes to San Diego ... rega Dall
Varicose ribs rounding over the shoulder without spine or angulation
. Varicose ribs 9 to 11
5 whorls (decollated) 11.5 x 6 mm. San Diego ..... zephryrina Dall
.. Varicose ribs solid, thick, not continuous
6 whorls (decollated) 17 x 7.5 mm. Puget Sound ... denisclathrata Dall
.. Varicose ribs with anterior face flattish, smooth
6 normal whorls 19 x 6.5 mm. San Diego .... barbarina Dall
.. Varicose ribs narrow, rounded, slightly flattened in suture
5 normal whorls 15.5 x 6 mm. San Diego .... presutura Dall
. Varicose ribs 14
.. Varicose ribs low, flattly reflected on the base
6 whorls (decollated) 5.0 x 2.5 mm. Monterey.. regiomontana Dall

(con.)

• Varicose ribs 18 to 19
•• Varicose ribs low, rounded, interspaces striated
9 whorls (decollated) 21 x 7.5 mm. Oregon to Lower Calif.. columbiana Dall
• Varicose ribs 20 to 21
•• Varicose ribs narrow, errect
6 whorls 3.25 x 1.6 mm. Monterey ....rectilaminata Dall
•• Varicose ribs smooth, strongly reflected
6 whorls 3.5 x 1.75 mm. Monterey .... berryi Dall

Nitidiscala Lower California to Chile
Varicose ribs with a spine or expanded angle at the shoulder
• Varicose ribs 6
•• Varicose ribs sometimes spined, finely striated
10 normal whorls, 21 x 9.5 mm. Gulf of Calif. .... prehexagonumDall
U.S.N.M. 50:479
•• Varicose ribs strongly angulated, smooth
14 x 6 mm. ? California to Panama ... hexagonumSowerby
Oldroyd 2-2-59
• Varicose ribs 7 to 8
•• White with a flesh colored peripheral band
8 whorls 15 x 10 mm. La Paz to West Mexico ..... bialatum Dall
•• Uniformly white
••• Shell slender, angulation not prominent
8 whorls 11 x 4 mm. Gulf of California .... eutaenium Dall
••• Shell stout
•••• Ribs errect
••••• Ribs flattened on the base
7 whorls 4 x 2 mm. Lower Calif. to Panama ..... apiculatum Dall
••••• Ribs not flattened on the base
•••••• Ribs continuous up the spire
9 whorls 7.2 x 4.4 mm. Bahia Honda, Panama .... wurtsbaughi S. & H.
•••••• Ribs alternating in the suture
10 whorls 26 x 10 mm. Panama .... hindsii Carpenter
• Varicose ribs 9 to 10
•• Ribs spined
••• Spine half way between the suture and periphery
8 whorls 4.5 x 2 mm Gulf of California .... centronium Dall
••• Spine at the shoulder
•••• Shell narrowly umbilicated
10 whorls 8.76 x mm. Central America .... obtusum Sowerby
•••• Shell not umbilicated
••••• Ribs errect
7 whorls (decollated) 20 x 9 mm. La Paz .... pazianum Dall
••••• Ribs reflected
7 whorls 10.5 x 4 mm. Santa Barbara Islands to Gulf.californicum Dall
•• Ribs angulated, not spined
10 whorls 8.75 x mm. Central America .... aciculicum Hinds
• Varicose ribs 11 to 12
•• Shell angulated at the base
5 whorls (decollated) 2.75 x 1.75 mm. Panama ... columnellum Dall
•• Shell not angulated at the base
5 whorls (decollated) 5 x 2 mm. San Diego to Panama..diegensis Dall
• Varicose ribs 13 to 14
•• Ribs low, spined on the early whorls
8 whorls 12 x 6.5 mm/ Pt. Abreojos .... roberti Dall
•• Ribs sharp, a blunt angle at the suture
7 whorls 4 x 2.5 mm. Pt. Abreojos to Gulf ..... compradorum Dall

(con.)

Varicose ribs without spine or marked angulation
. Varicose ribs 5 to 6
.. Ribs very broadly reflected
7 whorls 19 x 9 mm. Gulf of Fonseca .... strongianum Lowe
.. Ribs strong, wing like
6 whorls 12.5 x mm. Gulf of Nicoya .... dianae Hinds
. Varicose ribs 7 to 8
.. Upper whorls flesh color, lower white
8 whorls 8 x 4 mm. Magdalena Bay .... phanium Dall
.. Shell uniformly white
9 whorls 4.5 x 2.2 mm Bahia Honda, Panama .... gissleri S. & H.
. Varicose ribs 9 to 11
.. Base marginated by a strong cord
7 whorls (decollated) 15 x 7 mm. Panama .... basicum Dall
.. Base not marginated
... Upper whorls lilac, last whorl white
9 whorls (decollated) 9 x 5 mm. Magdalena Bay.. callipheplum Dall
... All whorls white
.... Ribs not continuous up to the spire
7 whorls 3 x 1.5 mm. Panama .... tabogensis Dall
.... Ribs continuous up the spire
..... Ribs sharp, pitting the suture
6 whorls 9 x 4.5 mm. Gulf of Calif. .... colpoicum Dall
..... Ribs low, rounded
10 whorls 9 x 3.5 mm. Panama .... cumingi Carpenter
. Varicose ribs 12 to 14
.. Shell stout, broadly conic
7 whorls 11 x 6 mm Mazatlan ....suprastriatum Carpenter
.. Shell slender, elongate conic
... Ribs not continuous, low, thread like
5 whorls (decollated) 4 x 1.5 mm. La Paz ...... cylindricum Dall
... Ribs continuous
.... Ribs low, closely appressed to the whorls
9 whorls 14 x 4.5 mm. Acapulco .... appressicostatum Dall
.... Ribs stout, smooth
9 whorls 28.5 x 9.5 mm. Montijo Bay..... gaylordianum Lowe
. Varicose ribs 16
.. Whorls well rounded
... Ribs low, rather thick
5 whorls (decollated) 7.5 x 4 mm. Galapagos ... haboli Dall
... Ribs broad, curved
7.5 whorls (decollated) 15.9 x mm. Ecuador.. strongi Bartsch
. Varicose ribs 18 to 22
.. Ribs strongly curved
... 6 whorls (imperfect) 2.3 x 1.5 mm. Panama....... imbrex Dall
.. Ribs not strongly curved
9 whorls 3.2 x 1.6 mm. Corrientes, Mexico ..... willetti S. & H.

Epitonium indianorum (Carpenter),1864	Forrester Island to Puget Sound
Epitonium hexagonum (Sowerby),1844	Santa Cruz to Panama
Epitonium cooperi Strong,1930	San Francisco to Gulf of Calif.
Epitonium tinctum (Carpenter),1864	Monterey to Gulf of Calif.
Epitonium crebricostatum (Carpenter),1864	Vancouver to Gulf of Calif.
Epitonium diegensis (Dall),1917.	San Diego to La Paz
Epitonium californicum (Dall),1917	San Miguel Id. to Gulf of Calif.
Epitonium musidorum (Dall),1917	San Diego to Panama
Epitonium caamonoi (Dall and Bartsch),1910	Puget Sound to San Diego
Epitonium persuturum (Dall),1917	San Diego

Epitonium densiclathratum (Dall),1917	Puget Sound to San Diego
Epitonium rectilaminatum(Dall),1907	Monterey to Gulf of Calif.
Epitonium regiomontanum (Dall),1917	Monterey
Epitonium sawinae (Dall),1903	Vancouver to Lower Calif.
Epitonium berryi (Dall),1907	Monterey to San Diego
Epitonium inconspicuum (Sowerby),1847	San Diego south
Epitonium columbianum (Dall),1917	Forrester Island to Gulf of Calif.
Epitonium pedroanum Willett,1932	San Pedro
Epitonium callipeplum (Dall)1919	Magdalena Bay
Epitonium phanium (Dall),1919	Magdalena Bay-Montijo Bay
Epitonium apiculatum (Dall),1917.	Lower Calif. to Panama
Epitonium cylindricum (Dall),1917	La Paz
Epitonium basicum (Dall),1917	Gulf of Calif. tp Panama
Epitonium compodorum (Dall),1917	Gulf of Calif.
Epitonium colpoicum (Dall),1917	Gulf of Calif.- Montijo Bay
Epitonium pazinum (Dall),1917	La Paz to Acapulco
Epitonium bialatum (Dall),1917	Gulf of Calif. to Panama
Epitonium prehexagonum (Dall),1917	Gulf of California
Epitonium roberti (Dall),1917	Gulf of California to Central America
Epitonium eutaenium (Dall),1917	Gulf of Calif.
Epitonium centronium (Dall),1917	Gulf of Calif.-
Epitonium willetti Strong & Hertlein	off Mazatlan
Epitonium strongianum Lowe	San Salvador
Epitonium regularis (Carpenter),1866	Acapulco to Panama
Epitonium appressicostatum (Dall),1917	Acapulco
Epitonium duringi (Carpenter),1856	Panama
Epitonium hindsii (Carpenter),1856	Panama
Epitonium obtusum (Sowerby),1844	Panama
Epitonium columnellum (Dall),1917	Panama
Epitonium imbrex (Dall),1917	Panama
Epitonium thylax (Dall),1917	Panama
Epitonium zeteki (Dall),1917	Panama
Epitonium gaylordianum Lowe	Panama
Epitonium haboli Dall,1917	Galapagos
Epitonium rhytidum (Dall),1917	Galapagos
Epitonium strongi Bartsch,1928	Ecuador
Epitonium reedi Bartsch,1928	Ecuador

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Epitonium indianorum (Carpenter),1864. Forrester Island, Alaska to Todos Santos Bay, Lower Calif. (Dall). Type locality, Neah Bay, Washington

Collecting data: Off Avalon, Catalina Island in 35 fms.; off Redondo Beach in 25 fms. gravel- not common; several local Pleistocene deposits such as Hilltop Quarry, Baldwin Hills, Timm's Point etc. (Burch); Forrester Island and Ketchikan, Alaska (G. Willett); Victoria, B.C. (Lewis)(Willett); 65-71 fms. off Point Pinos (USFC). This seems to be a fairly deep water species at least from Monterey south (A.G. Smith).

Epitonium tinctum (Carpenter),1864. Vancouver, B.C. (Keen) to the Gulf of California. Mr. A.M. Strong, (reference above) places in the synonymy of tinctum, Epitonium fallaciosum (Dall),1917 and Epitonium subcoronatum (Carpenter),1866.

Dr. A. Myra Keen advises to note the correct date of this and the previous species as 1864 not 1865, and also comments on the com on designation of San Pedro, Calif. as the type locality " The type locality of tinctum is ' Lower California and San Diego'. The San Pedro locality could be used only if someone designates the specimen Mr. Strong figured as a lectoholotype."

(con.)

Mr. Strong states " The species differs from Epitonium indianorum (Carpenter) principally in the smaller size, more robust form, and in the presence of the color band."

Collecting data: This species also seems to be associated with the sea anemones. Mrs. E.P. Chace called attention to the fact that this is a different sea anemone than the one associated with Opalia insculpta and that these small sheet anemones will irritate the skin very much like poison oak. However, when you find a large rock covered with these small anemones you can usually pick out a set of E. tinctum along with the poison. It is a common littoral species in our experience all around Monterey Bay,San Simeon, Cayucos,Morro,Malaga Cove,Palos Verdes,Pt. Vicente,Balboa,Corona del Mar, San Onofre,San Diego on Crystal Pier pilings and in holdfasts at Imperial Beach. We have dredged it as deep as 25 fms. off Redondo Beach (Burch);

Mr. A.G. Smith makes some interesting statements about this species: " As I understand it, Carpenter used the name subcoronatum for the form with the coronate varices. Both the coronate and the non-coronate forms are found at least from Monterey south. I agree with Strong that the form living under the anemones and otherwise off the northern California coast are slightly different and may be worthy of a subspecific name. I have it from several localities from Pt. Reyes north. It never has the varices coronate to any appreciable degree. I doubt if the name subcoronatum is available for it as the type of the latter, with its coronate varices, is not the same thing. Tinctum (typical) and the form subcoronatum are common in Monterey Bay and vicinity from shore to 10 fathoms."

In connection with the point discussed by Mr. Smith, John Q. Burch in the preliminary survey asked the following question ".. do we wish to recognize the slight differences ' heavier and somewhat broader' between typical tinctum and the northern species up to Vancouver,B.C., and if so Mr. Strong suggests that we may use subcoronatum as a subspecies ? However, the consensus of opinion returned on this question is perhaps well stated by Mr. George Willett " No. Many other species are larger in the north" However, there is no doubt at all that they are separable and we would all be pleased to have Mr. Smith describe and figure the northern race.

" Have specimens from Pismo and Cayucos,Calif. to San Martin Island, Lower Calif. (Miss Bristol of the San Diego Museum); common in shallow dredgings in San Diego Bay; common on the breakwater, Coronado; common Mission Bay; (W.K. Emerson);

This species as wellas the subspecies following was discussed by Mr. A H. Strong in Nautilus 55:46,47.

Epitonium tinctum bormani Strong,1941. Nautilus 55:46,47
Type locality, associated with sea anemones in Mission Bay,San Diego Co.

The original description follows: " Those shells live in close association with sea anemones in sand pockets and sand filled crevices in the rocks on the outer coast where theyare exposed to the wash of the surf. Recently Mr. and Mrs. Bormann of Long Beach, Calif. , collected a large number of specimens of apparently a distinct variety, associated with sea anemones in the quiet waters of Mission Bay, near San Diego. They are smaller than the typical form, with the varices almost entirely lacking the coronation below the sutures and averaging about two more to the whorl. The brown line below the suture is faint but visible in most of the living specimens. These may take the name of Epitonium (Nitidiscala) tinctum var bormanni. The type has been deposited as No. 1064 in the type collection of the Los Angeles County Museum. It has a little more than 7 post-nuclear whorls and 13 varices. The measurements are: length, 7.2 mm.; diameter,4.0,mm.

Epitonium persuturum (Dall),1917. San Diego, Calif.

Epitonium cooperi Strong, 1930. Trans. San Diego Soc. Nat. Hist. vol. 6, no. 7 p. 194, pl. 20, figs. 6a, 6b, 7, 8a, 8b, Aug. 30, 1930.

Mr. Strong places in the synonymy of this species " Scala tincta" as used by Arnold; hindsii as used by Packard; and fallaciosum as used by Jordan. The original description follows:

" Shell of medium size, pure white, thin; apex sharp, with the extreme tipbroken in all the specimens examined; remaining whorls about 8 in the adult, almost semi-circular in outline between the very deep sutures, regularly increasing in size, forming a slender turreted spire; ornamented with 11 or 12 thin varices which touch the varix on the preceeding whorl before reaching the bottom of the suture, but which do not fuse, and ascend the spire in a continuous line approximately parallel with the right side of the shell; varices on the middle and lower portion of the whorls somewhat reflexed, exposing the edges of the layers of cell-structure as faint axial striations, becoming erect and expanded at the shoulder of the whorls where they form coronating points, beyond which they dip concavely into the sutures; on the base the varices continue without change to the raised columellar lip under which they dip; spiral sculpture entirely absent; aperture nearly circular; columellar lip raised, sharp, curved, somewhat expanded at the junction with the basal lip, extending posteriorly to a junction with the outer lip, which is thickened by the last varix."

The type, No. 345, S.D.S.N.H., comes from San Pedro, Calif. and measures, length 20, maximum diameter 8 mm.

The species differs from the other species in the subgenus found on the west coast in the thinness of the shell and the very deep sutures between the loosely coiled whorls."

Range: Vancouver, B.C. south to Lat. 23 Dr. A.M. Keen advises " Ranges, north to Nanaimo, Vancouver Island, B.C. (Specimens in Oldroyd collection determined by A.M. Strong).

Collecting data: A common species in the dredgings off Redondo Beach in 25 fms. gravel, less common down to as deep as 75 fms. in out experience; taken littoral at San Onofre, Calif.; Anaheim Landing; Punta Banda, L.C.; Newport Bay, Calif.; and in the Estero below Ensenada, Mexico; washed in on Terminal Island; common in Baldwin Hills Pleistocene (Burch); San Martin Island, Lower Calif. (Baker); La Jolla (Lowe); " A bay mud species. The Monterey record cited by Dall is extremely questionable. Think it lives farther to the south" (A.G. Smith). * Note- while we have never taken it from Monterey or north of Monterey, our experience has been to find it definitely not a bay mud species but with few exceptions on rocky shores of the open sea and even dredged at considerable depths and then always associated with gravel or rock. (Burch).

Epitonium densiclathratum (Dall), 1917. Neah Bay, Wash. to San Diego. (Dall). Type locality, Puget Sound.

Collecting data: off Redondo Beach, Calif. in 50 fathoms (Burch); not recorded from Monterey (A.G. Smith).

Epitonium crebricostatum (Carpenter), 1864. Vancouver Island to Gulf of Calif. (Dall). Type locality, Monterey, Calif.

This species has long been a series of question marks with west coast collectors. Mr. George Willett suggests " Probably equals indianorum". Mr. A.G. Smith writes " See Strong (1930) on this. Agree with him that it is an extreme variant of tinctum, probably. I have one or two shells from Monterey that might possibly fit the requirements, but as Strong says, until he or someone else fixes a holotype crebricostatum will have to remain as a nomen inquirendum. (There's a $64 term for you.)"

Epitonium hexagonum (Sowerby),1844. Santa Cruz,Calif. to Pahama (Dall). Type locality, Acapulco,Mexico.

There seems to be serious question about the northern record of this species. Mr . A.G. Smith states " The Monterey record is unquestionably erroneous. Shells so labelled or identified from Monterey are properly E. evictum or E. montereyensis, (or both). Hexagonum is southern."

Collecting data: San Pedro, Calif. (G. Willett); specimens from Acapulco to Pacific Beach (Miss Bristol-San Diego Museum);

Epitonium tiara (Carpenter),1856. Catalina Island to Todos Santos Bay, L.C. Panama ? Type locality Panama.

Collecting data: Midspit, San Diego Bay and Ballast Point (Baker); La Jolla (Orcutt); Ocean Beach and Avalon,Catalina Island (Kelsey);

Epitonium columbianum (Dall),1917. Forrester Island, Alaska to Gulf of California. Type locality, off the Columbia River, Oregon.

Collecting data: off Monterey, Calif. in 20 fathoms, shale bottom(Burch); Forrester Island, Alaska in 20 to 40 fathoms (G. Willett); 10-20 fms. off Santa Cruz, rare (Gordon)

Epitonium sawinae (Dall),1903. Barkley Sound, B.C. to Catalina Island,Calif. Type locality, near Avalon, Catalina Island. Dr. Dall figured this species in Bulletin 112 and gave the range from Monterey south, but Dr. Keen called attention to the fact that Dall and Bartsch,1910, p.21 cited E. sawinae from Barkley Sound, B.C.

Mr. A.M. Strong in Trans . San Diego Soc. Nat. Hist. vol.6,pp.194-195, pl.20, figs. 9,10 " The large number of sharp varices makes the species quite distinct among the west coast species in the subgenus".

Mr. Strong places E. catalinensis (Dall),1917 in the synonymy. This is a mooted question though. Some of us have thought we could separate them. Mr. George Willett's note on this problem states it clearly " This is a difficult problem. Specimens taken in 20-40 fms. (San Pedro,Catalina) vary greatly, some shoulders being rounded, others angled and varices numbering from 19-27. This would confirm Mr. Strong's idea. However, 12 specimens taken at 200 fathoms off Catalina all have shoulders rounded and varices are more in number, 25 to 32." Therefore, we will retain E. catalinensis pending further study.

Collecting data for E. sawinae: off Monterey in 10-20 fms. shale; Santa Monica in 15-20 fms.; Redondo Beach, common in gravel at 25 fms. and not uncommon down as deep as 100 fathoms in mud and gravel; Avalon, Catalina Island in 35 fathoms; common Pleistocene fossil in Timm's Point, Baldwin Hills etc. (Burch); Monterey Bay, 10-56 fms., fairly common (A.G. Smith); San Diego from 50 fms. (Baker); Catalina Island in 50 fms. (Lowe)

Epitonium catalinensis (Dall),1917. Catalina Island,Calif.

Discussed above under E. sawinae.

Epitonium pedroanum Willett,1932. Transactions San Diego Soc. Nat. Hist. vol.7, pp.88,89, pl.5, fig.3. Type locality, off San Pedro in 20 fms.

The original description follows:

" Description of type.- Shell small, slender, thin, buffy-white; with ten whorls exclusive of the (lost) nucleus; varices fifteen, very low, slightly reflected, with no perceptible shoulder, and almost encircling the spire; whorls and base rounded; aperture oval, somewhat angled. Length,11.7; maximum diameter, 3.7.

Type No. 1036, collection of the Los Angeles Museum. The type and another smaller specimen were collected by G. Willett in 20 fathoms off San Pedro, California, September 9,1931. Paratype in the collection of the writer.

This species does not closely resemble any west coast Epitonium known to the writer. The varices are somewhat similar to those of E. columbianum Dall and the unshouldered variety of E. sawinae which Dr. Dall called catalinense. The varices of pedroanum, however, are fewer in number than in either of these species, and the shell is much more slender and of a different color. Furthermore pedroanum is much smaller than columbianum and longer than sawinae."

Epitonium californicum (Dall),1917. Santa Monica and Redondo Beach,Calif (Burch), San Miguel Island south to the Gulf. Type locality, San Miguel Island, Calif.

Mr. A.M. Strong figures a specimen from Alamitos Bay, Los Angeles county, in Trans. San Diego Soc. Nat. Hist. vol.6, p.195,pl.20,figs. 11,12a,12b,1930. Mr. Strong states" This species resembles Epitonium tinctum (Carpenter) in many ways, but differs in the more slender form, fewer and more reflected varices and in the lack of the color band."

Collecting data: off Santa Monica, Calif. in 15 fms.; off Redondo Beach in 25 fms. gravel.(Burch); San Diego (Baker); San Pedro (Lowe);

Epitonium rectilaminatum (Dall),1907. Monterey, Calif. to Gulf of Calif . Type locality, Monterey, Calif.

Collecting data: (See discussion under E. berryi below) - off Redondo Beach, Calif. in 25 fms., gravel (Burch); San Pedro, Calif. in 25 fms. (G. Willett); Monterey Bay, 10-15 fms., fairly common (A.G.Smith).

Epitonium caamanoi (Dall and Bartsch),1910. Ketchilan, Alaska (Willett) to San Pedro, Calif. Type locality, Barkley Sound,Vancouver Island,B.C.

Collecting data: Ketchikan, Alaska in 10 fms. (G. Willett); Olga, Washington (Engberg); no Recent records but have sets from San Pedro Pleistocene (Burch).

Epitonium regiomontanum Dall, in De Boury,1919. De Boury, E. " Etude sur les scalares de la cote Pacifique Americaine, a propos d'un travail de M. Dall", Jour. Conchyl,vol.64, no.1 (Jan.30,1919),pp 33-40.

The explanation for the above name is stated by Dr. A.M. Keen as follows (Per. Comm. Aug.,1945) " Epitonium montereyense Dall,1917 is a rejected homonym and cannot be revived again (Article 36, International Rules). It is true that the original name combination os the 1907 name is Scala (Cirsotrema) montereyensis , but as Dall in 1917 abandoned Scala in favor of Epitonium , this is tantamount to transferring all species he had named under the former to the latter, and so the second use of E. montereyense is invalid the moment it is put on paper".

We have no collecting records for the species.

Epitonium berryi (Dall),1907. Monterey to San Diego, Calif. Type locality, San Pedro Bay, Calif. in 200 fathoms.

Collecting data: Dr. Dall in the description mentions a set dredged by Dr. S.S. Berry from off Del Monte in 15 fathoms. Our experience has been to dredge it in 10 fms.and also 20 fms. on the shale off Del Monte in Monterey Bay. We also have a set labelled " part of original lot" ? from Mrs. W.H. Eshnaur. (Burch); there is a set in the San Diego Museum labelled Monterey from 12 fathoms' (Berry).

Mr. A.G. Smith discusses this species (Per. Com. Aug. 1945) as foll-

-ows:" Here is a tough one. My information from Berry is that the type came from Monterey in 12 fathoms, and is the only authentic specimen of berryi from Monterey Bay. I believe Dall cited others from southern California. This being the case, the original lot consists of a single specimen, the type; so you could not possibly have " part of the original lot". There must be an error somewhere. Dall just possibly might have lumped shells from more than one locality into a so-called original lot, but if he did this it was certainly bad practice and ought not to stand. Anyway, we think that the standing of berryi is questionable, believing it to be a variant of E. rectilaminatum. Berryi is a tiny species. We have not collected it."

* Note*- It is our intention to have all specimens involved in such disputes carefully checked by a committee of which we trust Mr. Smith will be a member before arriving at a final conclusion. The purpose of these notes is simply to accumulate as much information as possible to be used as a foundation for further study.(Burch).

Epitonium inconspicuum (Sowerby),1847. Off San Diego in 75 fathoms (Dall). Type locality given as West Indies by both Sowerby and Reeve.

Epitonium diegense Dall,1917. San Diego, Calif. to the Gulf of California. Type locality not stated in original description but Oldroyd says San Diego.

Subgenus Crisposcala De Boury,1886. Type (by original designation), Scalaria crispa (Lamarck).

There are several things to be determined regarding Crisposcala. In the first place Dr. Dall used it as a Section of Nitidiscala and the question is whether or not it is sufficiently distinct to key out as a subgenus. We then note that our two keys to genera and subgenera differ. Mr. Strong's key " Shell without a basal disk; spiral sculpture distinct; varices forming a ridged fold bounding umbilicus." Dr. A.M. Keen calls attention to the following " According to Durham (Jour. Paleont., vol.11,no.6,1937,p.483), Crisposcala has a basal disk; it is distinguished by a network of crossed spiral lines that produce a decussate appearance on the varices".

Epitonium catalinae (Dall),1908. Forrester Island, Alaska to San Diego, California. Type locality, south side of Catalina Island, Calif.

Collecting data: dredged off Redondo Beach in 75 fms. mud and gravel; off Catalina Island in 35 fms.; not uncommon in Timm's Point, San Pedro, Pleistocene (Burch); Forrester Island, Alaska in 20-40 fms.; San Pedro in 20 fms.; Catalina Island in 40-60 fms. (G.Willett); Prince William Sound, Alaska in 18 fms. (Lewis);(Willett); Monterey Bay, 21 fms. mud, a single specimen (A.G. Smith); 6 specimens (depauperate var.) dredged Santa Barbara Island, Calif. (Lowe in 1909) (San Diego Museum).

Epitonium regum Dall,1917. Point Reyes to San Diego, Calif. (Dall). Type locality, off Point Reyes in 61 fathoms.

Collecting data: off Monterey, Calif. in 15 fms. (Burch); Catalina Island in 40 fms. (G. Willett);

Mr. A.G. Smith comments on the above Monterey record as follows "Your record from Monterey Bay is the first one and adds a new species to our list. Are you sure of your identification?" * Note*- this was checked by Mr.Willett but will have them rechecked with others before establishing any new records. (Burch).

Epitonium acrostephanus (Dall),1908. Puget Sound (Lat.48, Keen Abridged Check List) south to Coronado Islands. Type locality, Monterey, Calif.

There was a little discussion as to the spelling of the above specific name, the question being is it -us or -um ? Dr. A.M. Keen advises as follows " As it seems to be a noun in apposition, acrostephanus would be correct."

Collecting data: off Monterey, Calif. in 15 fms.; Redondo Beach in 75 fms. mud and gravel; Avalon, Catalina Island in 35 fms.; not uncommon in the Pleistocene of Timm's Point, San Pedro (Burch); So. end San Clemente Island in 40 fms. (Baker); Santa Barbara Island (Lowe); 34-203 fathoms in Monterey Bay, scarce (A.G. Smith); S. Coronado Id. in 15 fms.(Willett).

Epitonium tabulatum Dall,1917. Monterey, Calif. (Burch) to Coronado Islands. Type locality, San Pedro, Calif.

Collecting data: off Monterey in 40 fms.; off Redondo Beach in 25 fms. gravel; not uncommon in the Pleistocene of Timm's Point, San Pedro (Burch); San Pedro (Lowe); San Pedro in 20 fms. and Catalina Island in 30-40 fms. (G. Willett); Monterey Bay, 10-25 fms, scarce. Also 43-44 fms. off Santa Cruz (USFC) (A.G. Smith).

Subgenus Globiscala De Boury,1909. Type (by original designation), Scalaria bullata Sowerby.

" Shell without a basal disk; spiral sculpture very fine or wanting; shell white; shell short and broad; varices thin and erect" (Strong)

Epitonium orcuttianum Dall,1917. San Diego, Calif.
Type locality, San Diego Harbor, foot of Broadway, C.R. Orcutt.

Epitonium barbarinum Dall,1919. San Diego, Calif. to Panama
Type locality, San Diego, Calif.

Epitonium zephyrium Dall,1917. San Diego, Calif.

Additions and Corrections

The following species should have been included in our list of the species of the subgenus Nitidiscala. The species was not included in Bull. 112 nor is the description in Oldroyd. The description follows:
Epitonium musidora Dall,1917. Proc. USNM, vol.53, no.2217, p.483,1917. Range, San Diego to Panama. U.S. Mus. Cat. No. 201203, but type locality not stated.

" Shell thin, white,slender, with an acute spire and deep suture;varices 10 or 11, low,thin,sharp,slightly reflected,anteriorly smooth,continuing over the suture into which they dip, and making a nearly complete circuit of the spire; base rounded, aperture subovate; there is a slight broadening of the varix at the shoulder of the whorl, but no angulation. Length,13; diameter, 5 mm. "

Collecting data: San Diego, Calif. (Baker); La Jolla, Calif. (Bristol-identified by Dr. F. Baker).

A.W.B. Powell, Auckland Institute and Museum, Auckland, New Zealand.

Re the interpretation of the Bulla complex, your Minutes #47, pp 20 and 21.

I am sorry to have to disagree with these findings, but one most significant fact has been overlooked by all concerned. Bulla Linnaeus, 1758, as a molluscan name is " stillborn". It appears on p. 725 of the 10th edition as a mollusc, but in the same work 298 pages earlier Bulla was first introduced as a subgenus of crickets, Gryllus (See Finlay & Marwick,1937, N.Z. Geol. Surv. Pal. Bull. 15, p.92).

The well known Atys Montfort,1810 stands (Type, o.d.: Atys cymbulus = Bulla naucum Linn. Synonyms Bulla Linn. 1758, p.725 (not p.427): Bullaria Rafinesque,1815 Subst. name for Bulla Linn. (the mollusc). Bullus Montfort,1810, a mis-spelling for Bulla Linn. (the mollusc).

Regarding the conventional usage of Bulla and Bullaria two names are available, Vesica Swainson,1840 and Quibulla Iredale,1929.

Iredale 1929, p. 349, dismissed Vesica Swainson as preoccupied by Vesica Humphrey,1797. By doing so he purposely ignored opinion 51 of the International Rules which reject the names of Mus. Calonn. The ignoring of these considered opinions of the International Commission is not shared by many workers other than Iredale, so Vesica Swainson 1840 retains status. It was proposed for ampulla and naucum, but Gray 1847 designated ampulla as type. Quibulla Iredale 1929 Type (o.d.) Bulla botanica Hedley is available for the cylindrical acorn-shaped " Bullas" with an open apical umbilicus.

Re your query Vesica quoyi- this was undoubtedly collected in New Zealand by Dr. Stanger, described by Gray in Dieffenbach's N.Z. 1843 and the type well figured by Smith in " Erebus and Terror" Zool. 1874.

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New Publications Received

" Some Notes on the Life and Explorations of Hugh Cuming", by William J. Clench, Occasional Papers on Mollusks, Mus. Comp. Zool., Harvard University, July 30,1945, No.3.

This 12 page account of the life of Hugh Cuming is interesting and valuable. The photograph is that of a portly pleasant appearing gentleman.

" Notes on the Family Cardiidae" by Lillian C. Smith. Occasional Papers on Mollusks, Mus. Comp. Zool., Harvard Univ., July 30,1945, No.4.

Several species are discussed, Fulvia bullata Linne, and Fulvia tenuicostata Lamarck from Australia and the East Indies; Acanthocardia spinosa Solander from the Eastern Atlantic; Cardium indicum Lamarck.

However, the most interesting discussion for us is on the genus Lophocardium and the species cumingii Broderip from Colombia and annettae Dall from Lower California.

" Mollusca", vol.1, no.6, Aug.10,1945. Among other papers of interest in this issue is one by Dr. Harold A. Rehder on " The Measurement of Shells". This paper is well figured and worth while. " Further Notes on Schistosomiasis" by Dr. Henry Van Der Schalie. " Conservation" by Dr. B.R. Bales.

Mollusca is published by Paul H. Reed, Tavares,Fla. $2.50 per year.

" Proceedings of the Malacological Society of London", vol.26, parts 4 and 5, 25 July,1945. There are several exceptionally valuable papers in this issue. The papers contained are: Book Notes by J.R. le B. Tomlin; On two species of Aglaja from the Andaman Islands by K.M. White; On the family Amphibolidae by B. Hubendick; The Living mollusc-II. How it works by A.T. Hopwood; Scandanavian Succineids and their distribution by N. Hj. Odhner; the Boltenian genera by R. Winckworth.

The Winckworth paper gives the types, references and other data on the Boltenian genera and will without a doubt be frequently quoted. We have been in great need of such a paper.

" The Australian Tertiary Mollusca of the Family Turridae" by A.W. B. Powell from Rec. Auck. Inst. vol.3, no.1, pp 1-68, 20th Sept.,1944.

This beautifully figured work reminds us of the really great work by Powell on the New Zealand Turridae in 1942. They should serve as an inspiration to some student to attempt a similar work for the fauna of this coast.

" Biological Primary Types in the Auckland Museum" by A.W.B. Powell, Rec. of the Auck. Inst. & Mus. vol.2, no.5,June,1941.
" The Mollusca of Stewart Island" by A.W.B. Powell, Rec. Auck. Inst. Mus. vol.2, no.4, pp 211-238, Oct. 1939.
" The Paryphantidae of New Zealand No.IV and The Genus Placostylus in New Zealand" by A.W.B. Powell from Rec. Auck. Inst. Mus. vol.2, no.3, pp. 133-150, Nov.,1938.
" A Pliocene Molluscan Faunule from Castle Point" " Additions to the Recent Molluscan Fauna of New Zealand" by A.W.B. Powell, from Rec. Auck. Inst. Mus. vol.2, no.3, pp. 157-170, Nov.,1938.
" New Species of Nudibranchiate Mollusca from Auckland Waters" by A.W.B. Powell, from Rec. Auck. Inst. Mus. vol.2, no.2, pp. 119-124,Dec.,1937.
" Discovery Reports" Vol. XV, pp 153-222, Pls. XLV-LVI, New Species of Marine Mollusca from New Zealand" by A.W.B. Powell, Cambridge University Press.
" Tertiary Mollusca from Motutara, West Coast Auckland" by A.W.B. Powell, Rec. Auck. Inst. Mus. vol.1,no.6, pp. 327-340, Sept.,1935.
" Upper Pliocene Fossils from Cape Runaway" by A.W.B. Powell from Rec. Auck. Inst. Mus. vol.1, no.5, pp 261-274, July,1934.
" Notes on the Importance of Recent Animal Ecology as a Basis of Paleontology" by A.W.B. Powell, reprinted from Proc. of the Sixth Pacific Science Congress,1939.

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Miss Viola S. Bristol, Curator of Mollusks, Natural History Museum, San Diego recently sent the editor the following note " I noted that Mr. Willett thinks Psephidea ovalis from Hawk Inlet, Alaska, collected by Mrs. Kate Stephens, should be checked. I wonder why ? We have one specimen abd Mrs. Stephens has two or three that she collected there in 1907. I was at her home recently and saw many of her Alaskan specimens, all of which, she told me, were identified by Dr. Dall. She has all of her specimens mounted on cards and marked in red ink " Identified by Dr. Dall" * Note*- Mr. Willett collected extensively in Alaska and one of his theories was that Dr. Dall and others were in error in identifying ovalis from the north. Mr. Willett thought that lordi and ovalis are two very distinct species with ovalis ranging no farther north than California. Of course, Grant and Gale and others have claimed that there is but one species on the coast. The editor has been disposed to agree with Mr. Willett's view and it will be interesting to study the northern ovalis when occasion permits.

Mr. Ernest N. Wilcox, 1738 Johnson Ave., San Luis Obispo, Calif. is our only member in San Luis Obispo County and he has collected extensively both north and south of Morro Bay. The following letter is of great interest to us in our distributional work.

" Enclosed is the list of localities you asked for, and I am very glad to make this small contribution to data. Morro Bay is an interesting field for collecting as it seems to be a meeting place for species from both north and south.

From South	From North
Chione fluctifraga (Sowerby)	Siliqua patula (Dixon)
Volsella capax (Conrad)	Volsella recta flabellata (Gould)
Donax gouldii Dall	Saxidomus nuttali Conrad
Tagelus californianus (Conrad)	Panope generosa Gould
Sanguinolaria nuttallii(Conrad)	Astraea inaequale Martyn
Forreria belcheri (Hinds)	Tegula montereyi (Kiener)
Pterynotus festivus (Hinds)	Tegula pulligo (Martyn)
Vesica gouldiana (Pilsbry)	Mitra montereyi Berry

At present there isn't much collecting except at the Bay's south end.

Marine Shells Collected in San Luis Obispo County, Calif. by E.N.Wilcox

Epitonium indianorum (Carpenter)- Cayucos,Cambria

Epitonium tinctum (Carpenter)- Cayucos,Shell Beach,Hazzard Canyon

Zonaria spadicea (Swainson) - Cambria, 1 specimen (Said to have been common at Shell Beach 40 years ago.)

Trivia californiana Gray-Cambria,Cayucos,Shell Beach,Hazzard Canyon

Erato vitellina Hinds- Cambria,San Simeon,Shell Beach,Cayucos

Cerithidea californica (Haldeman)- Very common south end of Morro Bay.

Aletes squamigerous Carpenter- San Simeon,Cambria,Cayucos,Shell Beach

Turritella cooperi Carpenter- Cayucos (1 specimen)

Litorina planaxis Philippi-Shell Beach,Avila breakwater,Shell Beach

Litorina scutulata Gould- Cambria,Shell Beach

Lacuna porrecta Carpenter- San Simeon

Crepidula onyx Sowerby- Morro Bay (often piled deep on Volsella)

Crepidula excavata Broderip- San Simeon, Cambria

Crepidula aculeata Gmelin- Cayucos,San Simeon,Cambria,Hazzard Canyon

Crepidula nummarius Gould- Cambria

Crepidula lingulata Gould- Cambria

Polinices lewisii Gould- Morro Bay

Polinices alta Dall- Morro Bay

Sinum debile Gould- Pismo Beach (Coll. by Harry Kerwin)

Acmaea mitra Eschscholtz- Avila,Cayucos,San Simeon,Cambria,Hazzard Canyon

Acmaea pelta Eschscholtz- San Simeon, Cambria

Acmaea patina Eschscholtz- San Simeon, Cambria

Acmaea digitalis Eschscholtz- Morro Rock,Cambria,Cayucos

Acmaea scabra Gould- Shell Beach,Cambria,Cayucos

Acmaea limatula Carpenter- Cambria,San Simeon

Acmaea asmi Middendorff- Cambria

Acmaea insessa Hinds- Cambria

Acmaea instabilis Gould- Cayucos

Acmaea paleacea Gould- San Simeon

Acmaea triangularis Carpenter- Shell Beach

Lottia gigantea Gray- San Simeon, Cambria

Tricolia compta(Gould)- Shell Beach

Astraea undosa Wood- A beautiful specimen collected off Pt. Buchon by Beck Brothers of Oceano.

Astraea inaequale Martyn- San Simeon,Cambria,Haxxard Canyon

(con.)

Homalopoma carpenteri (Pilsbry) -Shell Beach, Cambria
Tegula funebralis (A. Adams) - San Simeon, Cambria
Tegula brunnea (Philippi)- San Simeon, Cambria
Tegula montereyi (Kiener)- Morro Rock
Tegula pulligo (Martyn)- Morro Rock
Calliostoma costatum (Martyn)- Avila,Shell Beach, Morro Bay
Calliostoma annulatum (Martyn)- Cayucos
Calliostoma gemmulatum (Carpenter)- Shell Beach, Cambria
Calliostoma canaliculatum (Martyn)- Morro Bay (2 living specimens)
Calliostoma tricolor (Gabb)- Shell Beach
Calliostoma splendens (Carpenter)- Shell Beach
Calliostoma gloriosum Dall- Shell Beach
Calliostoma supragranosum (Carpenter)- Shell Beach
Haliotis cracherodii Leach- Cambria, Cayucos
Haliotis rufescens Swainson- Cambria, Cayucos
Haliotis assimilis Dall- Shell Beach, Hazzard Canyon
Fissurella volcano Reeve- Cayucos, Cambria
Megatebennus bimaculatus Dall- Cayucos, Cambria
Diadora aspera (Eschscholtz)- Cayucos,Cambria
Diadora murina Dall- Cambria
Lepidochitona lineata Wood- Cayucos
Lepidochitona hartwegii Carpenter- Cayucos, Shell Beach
Nuttallina californica Reeve- Cayucos,Morro Rock, Cambria
Mopalia muscosa Gould- Cayucos,Morro Rock,Cambria
Mopalia lignosa Gould- Cambria
Mopalia ciliata Sowerby- Shell Beach, Cambria
Ischnochiton fallax Carpenter- Cayucos,Cambria
Ischnochiton magdalensis Hinds- Cayucos,Cambria
Ischnochiton mertensii Middendorff- Cayucos,Cambria
Ischnochiton regularis Carpenter- Piedra Blanca,Cambria
Cryptochiton stelleri Middendorff- Cambria,Avila,

* Note*- Several of these species establish new range records. Chione fluctifraga north from San Pedro; Volsella capax north from Santa Barbara; Sanguinolaria nuttallii north from Mugu; Forreria belcheri north from Mugu; Pterynotus festivus and Vesica gouldiana north to Morro Bay.

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Mrs. E.W. Boerstler,P.O. Box 494,Corona del Mar, Calif. We are sorry to have missed Mrs. Boerstler on her recent call. She is an active collector and exchanges with word wide correspondents. On her return from the proposed trip to Guaymas, Mexico soon after the first of the year these exchange correspondents should be getting some nice shells.

Mrs. Mary Bormann,4331 Vermont St.,Long Beach 4, Calif. has just written a nice bit of news about two of our members. Miss Anna J. Tripp formerly of 82 Giralda Walk, Long Beach and Ensign Ralph D. Bormann Jr. are now married. Ensign Bormann graduated from Columbia University, N.Y. and received his commission as Ensign on August 23. They were married the same day at the Riverside Church. Ensign and Mrs. Bormann are coming home on leave the coming week. They have 18 days from the 23rd following which Ensign Bormann will go to San Francisco to report for sea duty.

Pfc. Walter C. Caldwell 14082830, 397th Bomb Sqdn.(H), A.P.O. # 838 c/o P.M., New Orleans, Louisiana. " I am now stationed in Panama and hope to be able to do some collecting while I am here. Would appreciate your sending the Minutes to the above address in the future and will be glad to hear from anyone interested in the marine shells of this region. "

* Note*- Permit the editor to suggest right here that he is one of those " interested".

Anthony D'attilio, 102 Hilltop Acres, Yonkers, N.Y. We are very glad to welcome Mr. D'Attilio to our shell circle. He writes " I notice that most of the members wish to exchange shells. Well in my case though I have an extensive collection of world wide shells, I don't have anything like a large series of duplicates. Several years ago you published lists of rare and dredged material for sale. Will you be doing this again? In any case I would like to know of any such dredged shells for sale."

* Note*- It is true that while we were dredging actively before the war we did sell some of the excess material in order to help defray the expenses of what we found to be anything but an inexpensive pursuit. However, it has been several years since we did any dredging and when we do resume our work in this line it is doubtful if we will resume the role of shell merchants. However, when we do again get to dredging our friends should all do well enough.

University of Illinois Library, Urbana, Illinois- We are pleased to add this great institution to our list of correspondents and have sent them a file of all of our available back issues.

San Jose State College, San Jose 14, California- We are glad to add this fine California institution to our mailing list.

Laura G. Snyder,1345 S. Clifton,Wichita,Kansas. Miss Snyder is interested in buying fine shells and has in the past made some rather extensive purchases. She is particularly interested at this time in material from the south Pacific and especially Tridacna and Isocardia.

Perhaps some of our members will be interested in writing her.

E.J. Post,609 W. Emma St., Tampa 3, Florida- We were happy to have a nice letter from our long time member,Post. And he sent a box of shells which arrived in good order. Mr. Post comments on the shells " I found these specimens of Pomacea paludosa Say in a fish pond at the Tampa water works. They were laying their eggs all over the concrete wall above the water. Some were 2 or 3 feet above the water. There were at least 50 eggs in a mass. They looked like fish eggs and about the same size, but each egg had a regular shell but they were very thin, about as thick as an onion skin. I took one home and it laid about 75 eggs and they hatched in 30 days. The Physella pomilis arionus Clench from Tampa, Fla. are for Dr. Gregg. The Olivella mutica Say are for you. The reason I am sending them is that it is quite rare to find pure black ones. They are most always nearly white or striped. They have changed the name of them also. Clench says that mutica belongs to the Bahamas. I have been trying for some time to get them off to you, but my health has been very poor. We have had 40 inches of rain this year. We had 33 inches from June 15 to the first of August."

Mrs. Ida Worthy, R.D. Patunahoe, Auckland, New Zealand. We are very glad to have a long friendly letter from our correspondent on the other side. Many fine shells in our collection bear her labels and we are happy to learn that we have a box of New Zealand shells in the mails. It seems that our cousins in New Zealand are a little ahead of us on the reconversion with the shell collecting. Most of us seem to be unable to realize that it really is again possible to take off on a shell excursion.

Mrs. Leonie Woollacott, c/o Charlie Messenger, Beach Rd., Edgecliff, Sydney, N.S.W., Australia. We are interested to learn of the club and that they now have a study night as well as the usual lectures. A few excerpts from her interesting letter follow. " Tom Iredale is preparing an additional N.S.W. list, but I do not know when it will be published. The Australian Zoologist contains some good articles from time to time, but I should think you would get this regularly. If you are interested in land mollusca, I will see if Tom Iredale's illustrated booklets are available. "

Additions and Corrections

Minutes # 51, pp 3-10 covered the family Nassariidae. The following letter has been received from Lillian C. Smith, Museum of Comparative Zoology, at Harvard College.

" I was particularly interested in your discussion of Nassarius, since I had recently spent some time on that tangle of names and species.

If you use the name Nassarius and consider it a substitute name for Nassa Lamarck, should it not have the same genotype, namely Buccinum mutabile Linne'. Woodring so states, p. 264.

Also one other question. Does this name not date from Froriep 1806 ? I have not seen the Froriep translation, but we do have Iredale's word for it. As I understand it, Duméril used the word nassarius but it was not until Froriep combined a species with it that it could be called a proper generic description.

You will find that Thiele, p. 322, includes Nassarius Froriep in the synonymy of Nassa Lamarck, which he considers valid. He used arcularia Linne' as the type of Nassa s.g. and section, however. He cited mutabilis Linne' as the type of the s.g. Sphaeronassa Locard 1886.

I shall be interested to hear other opinions about the genus Nassarius. P.S. Is Nummarius p.5 a simple misprint? Does this constitute publication of a new genus ?

* Note* Regarding the P.S. the answer is yes. Please change the first two species on #51 p 5 to Nummarius. Editor. It could not be publication of a new generic name under International Rules, Article 25 (3).

The above letter was submitted to Dr. A. Myra Keen of Stanford University and the following letter is the result.

" As Mrs. Smith is a person who has a disturbing habit of being right when she poses a query, I have gone into the Nassa-Nassarius problem again. On the basis of a photostatic copy of the Froriep translation, I had adopted solution 3 of the discussion below, but now I am inclined to accept Mrs. Smith's conclusion -- solution 2.

First, as the works in question are rare, a brief word as to their content (for a fuller review, see Iredale, Proc. Malac. Soc. London, vol. 12,1916,pp. 79-84): Duméril's " Zoologie Analytique.." appeared late in 1805 or early in 1806. It consisted in the main of synoptical tables in which generic names were used only incidentally, as " Les nassiers (nassarius)." Late in 1806 a German translation of Dumérils work by Froriep appeared. In this work species were cited as " 6. Die Nassaschnecke (nassarius) bewirken durch die hervorregende Basis ihres um die Spindel des Gehauses bewegten Fusses, eine Vertiefung, der Hauptcharacker der Schaale ist. Der breite Fuss ist vorn wie gestutzt, ragt aber weiter als der Kopf hervor. Z.B. Buccinum arcularia L."

There are three alternatives, as I see it:

1. Reject all of the names on the ground that being written with a small initial letter they are not available nomenclaturally under a strict interpretation of Article 8 of the International Rules. A somewhat analagous situation is discussed in Opinions 182 and 183, just issued, in which the decision is reached that names proposed in the plural or in a case other than nominative are to be rejected. I believe that such an action would raise more problems than it would solve,however; we should probably have to adopt Nassaria Link , which has been used in a widely different sense.
2. Regard Duméril's names as emendations of Lamarckian and Linnaean genera. So far as the text proper, especially the Froriep translation, is concerned there is no evidence for this interpretation, but Iredale points out that

in the introduction to his work Duméril cites Lamarck,Poli, and Cuvier and credits them, especially the latter, with revising the classification of Linne! Therefore, we would seem to be justified in considering his names as emendations; they are thus strictly analagous to the Achatinus Montfort,1810, rejected in Opinion 120 as an emendation of Achatina Lamarck 1799. A recently published Opinion, Opinion 148, establishes as a general principle that " A generic name published as an emendation of an earlier name of the same origin and meaning is to be rejected as a synonym of the earlier name, and the type of the genus bearing the emended name is automatically the same species as the type of the genus bearing the earlier name so proposed to be emended... A generic name is to be rejected as a homonym if it has previously been published as an emendation of another generic name of earlier date." Therefore, Nassarius Duméril , must take the type Buccinum mutabile Linne', and Nassarius Froriep becomes a homonym.
3. Regard Duméril's names as genera without species , and consider that the first species cited later should be type. In view of the reiteration of the International Commission of the principles concerning emendations, and in view of the evidence submitted by Iredale, I retreat from my previous adoption of this solution.

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In connection with the above the treatment given it by Winckworth, Boltenian Genera, Proc. Malac. Soc. London, vol.26, p.141,July,1945.
" Nassa,132. Type, designated by Dall 1909, N. picta R.- Buccinum coronatum Gmelin,1791 - Buccinum sertum Bruguiere,1789. Iopas H. & A. Adams,1853, is a synonym. This antedates Nassa Lamarck,1799, type Buccinum mutabile L. 1758, for which Nassarius Duméril,1806 is available."

This matter seems to be running close to the Purpura perenniel dispute. And Purpura is certainly not neglected by Winckworth in this paper. Winckworth follows many others in refusing to acknowledge Purpura Martyn 1784 on the ground that Martyn cannot be regarded as strictly binary. We have published several articles on the Martyn names in our Minutes. We have naturally beendisposed to favor retaining Purpura Martyn because the type is our own well known foliata. However, Winckworth is probably correct in his conclusions, but if he is and Purpura is given the type P. persica (L.)- Buccinum persicum L. 1758 , this is an entirely different group and we must find another generic name for our California species. The most startling thing about Winckworth's conclusions though if I understand them is that if accepted we will be using the generic name Purpura for the species we now place under Thais.

There are a number of other discussions in this paper of great interest to us also. We will discuss them in time.

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The following collecting records were received from Mr. W.J. Eyerdam after our paper was written.

Opalia wroblewskii Morch,1876. Drier Bay, Knight Id., Pr. Wm. Snd.,Alaska 1923-10 fms. mud. This is an extension of range northward from Forrester Island.

Epitonium greenlandicumPerry,1811. False Pass, Unimak Id., Aleutian Ids. (Eyerdam 1932), also Sitkalidak Id. 1931.

Epitonium indianorum (Carpenter),1864, Strait of Fuca.

Minutes of the September Meeting of the Conchological Club of Southern California

The Conchological Club of Southern California met Sept.2,1945 at the usual time and place. There were two new members present, Agnes J. Shumate, 3680 Colonial Ave., and John T. Boyd, 429 Belden Ave., both of Los Angeles and both desiring active membership.

No reports of standing committees were given.

The president, Dr. W.O. Gregg, asked for a report on the desirability of changing the date of the meetings and from the discussion it was arranged that a further expression of members on the subject be asked for in the Minutes and their wishes in the matter.

It was moved and carried that the Program Committee be instructed to prepare papers as in pre-war times, of a more general nature to supplement the regular study material that is being carried on.

The regular discussion was then carried on as will appear elsewhere in the Minutes.

Effie M. Clark, 402 S. Normandie.

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* NOTE* Members are requested to write the editor their wishes regarding a change in time of meeting to evening meetings again and also to suggest the most desirable evening of the month for them.

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All active members are urged to be present at the next meeting at which time we will discuss our plans for renewing our pre war activities.

There will be several lots of nice Pacific shells for distribution among the members present.

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Mrs. Henry Hildebrandt, Winthrop, Minnesota. We are glad to send the Minutes to Mrs. Hildebrandt.

Mrs. Lewis H. Craig, 2024 4th St., So., Nampa, Idaho is interested in purchasing shells in case any of the members are interested.

W.J. Eyerdam, Oceanic Fisheries, Port Vita, Kodiak, Alaska, Aug.12,1945. Mr. Eyerdam writes " In spite of the long hours, I have kept up with my botanical collecting and I already have a stack of herbarium sheets over five feet high. I also have collected about 85 species of marine shells. Some day I will send in a report on all the shells I have collected on Afognak Island. Volcanic mud from the Katmai eruption covers the bottom everywhere in the bays and deep water along the Kodiak Island shores and had undoubtedly changed the bottom fauna very much. I will be here until October 1st."

Mr. A. Sorensen, 247 Granite St., Pacific Grove, Calif. Mr. Sorensen sent us newspaper clippings about the Monterey Peninsula Hobby Show, and he has good reason to be proud of the First Prize, a Victory bond. The display must have been fine from the descriptions of it. The display was entered as : Conchology, scientific collection and classification of shells, crustacea, and star fish from his collection of over 3000 species. Mr. Sorensen writes " This collection attracted far more attention than any other of the 23 exhibits. I was busy answering questions, which goes to show that shell collecting is popular.

Mr. Sorensen reports that he has just enjoyed a nice visit from Dr. and Mrs. H.R. Hill of the Los Angeles Museum.

Wm. J. Bower, 340 3rd St. S., St. Petersburg 5, Florida. We are advised that Mr. Bower is again in Florida and to send his mail there instead of to the recent New York address.

Janthinidae Pediculariidae
Eulimidae Cypraeidae
Cominmiidae Eratoidae
Atlantidae
Amphiperatidae

#53 p 1 October, 1945

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
October 1945

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, non-members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or $1.25 each six months.

See later page for the announcement of the time and date of our next meeting. This matter will be considered at the next meeting.

Please mail all news about shells, shell publications, shell collectors, shell trips etc. to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.

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The Nautilus, vol.59, no.1, July, 1945 has been received. None of the articles deal directly with the fauna of this coast, but under the Notes and News Dr. W.P. Woodring discusses one of the problems we had under consideration some time ago, namely the northern limit of the range of Dosinia ponderosa. Dr. Woodring states that the only specimens in the National Museum from San Diego are obviously fossils, and that the ".. northernmost Recent specimens in the National Museum collection are from Scammon's Lagoon, Lowe California (off Sebastian Vixcaino Bay), 350 miles south of San Diego" And Dr. W.O. Gregg has a note " Southern Record for Hosperarion Niger" announcing the taking of this species for a new southern record " in a meadow west of Poso Creek and about one half mile north of Glenville-Woody road in northern Kern Co. which is approximately 35 miles northeast of Bakersfield, Calif."

The other paper of particular interest to us is Dr. Paul Bartsch's " Morrisonella, a New Genus of East Pacific Deep Sea Mollusks". Dr. Bartsch has described this genus for the species described by Dr. Dall as Leucosyrinx pacifica, but which he placed in Bulletin 112, p.69 as Irenosyrinx pacifica (Dall), 1908. Inasmuch as this species is an Albatross collection from 1569 fathoms on ooze bottom it is unlikely that many of us will be personally concerned with labelling specimens.

Dr. B.R. Bales has a five page paper entitled " Diggin' 'em Out" written in Doc's breezy style is both informative and entertaining, and applied equally to this coast and any other.

Dr. H.A. Pilsbry and Thomas L. McGinty have a really fine paper in this issue " Cyclostremmatidae and Vitrinellidae of Florida". This is the kind of article of which there are entirely too few. The entire group is reviewed and figured with what looks like a really workable key. So many new species are described leaving it up to the student to try to find something else to compare with it, and the amateur student especially needs a little more help than that. Other articles are " Durangonella, A New Hydrobiine Genus from Mexico, with Three New Species" by J.P.E. Morrison; Determining Species in Pisidium by the Shell" by H.B. Herrington; " A List of Molluscs from Warren County, N.Y." by Morris K. Jacobson; " Buccinum Zebra Muller, the Type of Orthalicus" by Harald A. Rehder; " The West Indian Fauna in Southern Florida" by Dr. Wm. J. Clench.

We have an interesting letter from E.S. Richardson, 25 A, Carlson Gone Rd., Auckland C3, New Zealand " The members of the Auckland Museum Conchology Club desire to become corresponding members with your club.. so are offering our club notes in exchange for your own. ..... We send greetings to the conchologists and paleontologists of your club"

We have the first of the papers from our cousins on the other side and it is a fine report on the " Limpets" by A.W.B. Powell 26/7/45. Needless to say we will be more than happy to send all of our publications to the Auckland Museum Conchology Club. We are at this time sending to New Zealand approximately twenty copies of each issue of our Minutes.

If any of the New Zealand members are interested in exchanging and care to write the editor their wishes we will be glad to run the account in these papers.

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The Long Beach Shell Club is apparently again meeting after the summer vacation. We have the following note from Mrs. Lehman, Secy. Pro tem. - " Long Beach Shell Club met at the home of Miss Rogers for a social meeting. Mrs. Wilkins showed some of the very fine specimens from the Zech collection, giving interesting information which was added to by Mr. and Mrs. Chace. Other shells from Florida beaches were shown by Mrs. Paxon. Mrs. Lehman and Mrs. Bormann were responsible for the enjoyable refreshments. Next month's meeting will be held in the Children's Room of the Library and future meeting time will be discussed."

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Mr. A.G. Stevenson, 32 Pentland Ave., Mt. Eden, Auckland S2, New Zealand. Mr. Stevenson and Miss Holloway are sending us a small box of shells which will, of course, be open for distribution to interested members at our meeting. The following excerps from the letter should be of real interest to members interested in exchanging " If any of your members are interested in exchanging publications we would be glad to hear from them. There are many American publications that we need and we would be glad to send a list of what we can offer on N.Z. shells or natural history. " The editor wishes to state here that he has in his collection many beautiful sets of first class material from Miss Holloway, and as for the books there are a number of the New Zealand publications that are of great value working with shells from any locality. For example Powell's monograph on the New Zealand Turridae contains a complete " Synopsis of Turrid Generic Names" and I find it out on my table half the time although it has been long since I have looked at a New Zealand turrid. And Suter's Manual of N.Z. Mollusca is certainly one of the really worth while works on conchology. Mr. Stevenson also hits a thought many have had when he says " We would like very much to get in touch with some shell people in or near Japan". I can't help from hoping and thinking for my old correspondents Kinoshita, Kanamaru etc. There are no more beautiful shells on earth than the Japanese.

Leslie Hubricht, 300 E. Plume St., Norfolk 10, Virginia. " ... I am planning to build a shell cabinet that I can just close up without packing the specimen and move and still have the specimens readily accessible for study. Have you any ideas?"

* Note*- I have three cabinets or rather boxes that seem to answer Mr. Hubricht's idea. These are well made boxes with a number of trays so made that they fit down into the boxes very much like the trays in some of the older trunks. These trays are built with partitions of varying size and the depth of the trys vary also. I have found this affair to be unbeatable to take a study collection on a trip. The three boxes close up and are easily handled. Perhaps my blue print is not sufficiently clear. Of course, all sets handled in this way should be numbered.

Mrs. W.S. Telford, 3701 Bay Shore Drive, Sarasota, Florida. Members interested in exchanging should correspond with her.

Family Janthinidae

Genus *Janthina* Roeding,1798. Type by tautonymy, *J. violacea* R. = *Helix Janthina* L. 1758, *Janthina* Lamarck,1799, is identical. Fide Winckworth, Proc. Mal. Soc. Lon. vol.26,p.140,1945.

There has been some difference of opinion regarding the correct spelling , some authors having used I instead of J. Dr. Joshua L. Baily Jr. calls attention to some of the data surrounding the name," The name *Janthina* was originally used by Linnaeus as a specific name. He called it *Helix janthina*. It was first used as a genus by Bolten. We do not have a photostatic copy of Bolten here, but we do have a copy of the Index to Bolten published in Smithsonian Miscellaneous Collections. In this work it appears that Bolten sometimes spelled the name with a J and sometimes with an I. The species which he assigned to each one are not identical, which makes me think he may have intended to have two separate genera. This is so unlikely however that I believe it will be necessary to consider such matters as page priority etc. to decide the correct spelling. U.S. Grant at the U.C.L.A. has a photostatic copy of Bolten, and it would be wise for you to write him, inquiring how he spells it. I have not consulted the original , and I mention this matter only to show you that here is a point that should be looked up."

However, it is apparent that the great majority of recent writers have been using the J.

Thiele in " Handbuch der Syst. Weich.",1929 uses a number of different subgenera- p.225. However, the consensus of opinion seems to be that these subgeneric names have little or no value and here at least we propose to ignore them.

There has been a great deal of confusion with the species of this group from our coast. The result is that identical shells bear a number of different labels in collections.

Janthina bifida Reeve,1858. Conch. Icon. vol. 11, *Ianthina*, pl. 5, fig. 25 a-b. Type loc.: Pacific Ocean (Sandwich Islands).

This is the name in general use for the species originally listed as *Janthina exigua* Lamarck,1822 by Dall in Bull. 112. Dr. Dall gave the name *bifida* Nuttall in his Additions and Emendations to Bull. 112, vol.63, art.10, p.3. Here Dall gives the reference Jay Cat. p.68,1839. However, Dr. A. Myra Keen advises on this " The Jay citation is a nomen nudum. It says, " *J. bifida* Nuttall. Wahoo." Dr. Keen also sent us the original description as follows:

" Original description (Latin not transcribed here): " Shell turbinated, spire acuminately conic, whorls rounded, rather narrow, concentrically densely lamellately striated, striae very obliquely sinuated in the middle; deep-violet; columella thinly reflected, arched; aperture small, enormously notched..The densely set lamellar striae are less conspicuously wrinkled in this species than in its cogener *I. exigua*. Its principal characteristic is the enormous notch in the aperture, which gives the lip a bifid structure."

Dr. Joshua L. Baily Jr. comments on this species as follows (Per. Comm. Aug.,1945) ." The species which we formerly called *J. exigua* is something else. I have seen the specimens in your collection from New Zealand and from Florida, and I agree with you that they are quite distinct from our species, as well as from each other. The name *bifida* is the next oldest name, but there is some doubt in my mind as to whether we can use it. You give the authority for this name as Nuttall in Jay's Catalog... but I think it more likely that Reeve made a mistake in giving this reference, and that Dall and you both followed Reeve. Also Tryon credits the species to Nuttall, but does not mention Jay. Mrs. Williamson credits the name to Totten. If poss-

-ible you should locate someone who has access to Tottenand see what he has to say-about it. Keep, in West Coast Shells, first edition, gives Nuttall as authority for the name trifida, which he uses, and Mrs. Williamson also gives the name trifida. It is not impossible that we may find that the Florida form is J. exigua, the New Zealand form J. bifida, and the California form J. trifida. This is another matter on which I cannot speak authoritatively but which needs further investigation. ... Finally, converning your statement that J. trifida , if that is its correct name, from San Diego looks different from the same species from Los Angeles County, I have no comments. They look the same to me."

Collecting data: We have collected a few of these at odd times at many points along the coast from Pacific Grove south to Mission Beach. The biggest catch we ever made though was a t Hermosa Beach, Calif. duringa furious wind storm. Mrs. John Q. Burch did the collecting, the other members of the family being away. An interesting note was the washingashore of deal specimens of Catalina Island land snails along with the Janthina. There is a saying that they are only washed in following three days of heavy in shore winds. (Burch); Occasional at Monterey. They came a shore thick a number of years a go at the entrance to Bodega Bay, which I believe is a new northern record. Used to call it exigua, which is apparently another species; (A.G. Smith); Have specimens from numerous places along the coast, also Hawaii and the Kermadecs (Miss V. Bristol, San Diego Museum).

Range; Bodega Bay (Smith) to west Mexico. Pelagic.

Janthina globosa Swainson,1822. Puget Sound to Gulf of California. Pelagic. Dr. A.M. Keen advises " The type locality of J. globosa was not given by Swainson.

Collecting data: Dr. Joshua L. Baily Jr. advises (Per, Comm. Aug. 45) " The species from our coast that has been called J. globosa is to my mind indistinguishable in every way from J. globosa from Florida except in being smaller. However, there are big specimens from Baja California that are typical J. globosa, and this species can safely be included in our fauna."; " The late Mrs. Fackenthall collected a few specimens of this at Monterey. Theyare in her collection still, I believe" (A.G. Smith); 15 specimensand dried floats washed a shore at San Diego (Gander); Lower Calif. and Gulf (Dr. F. Baker); Tres Marias Islands and Manzanillo,Mex. (Lowe);

Janthina janthina Linnaeus,1767. San Diego southward. Worldwide. Synonymy; J. caeruleata Reeve,J. fragilis Lamarck,J. communis Lamarck etc.

Dr. Joshua L. Baily Jr. discusses this species (Per. Comm. Aug. 45) " The third species found on this coast which Dall called J. ceruleata looks to me like the typical J. janthina which is the same as J. fragilis. It is apparently very rare in California, the only collections I know in which it is represented are those of S.S. Berry and Maxwell Smith. Both of their specimens a re depressed,and look more like Reeve's figure of J. planospira than any of the others. But knowing how variable the elevation of the spire of this species in Florida can be, I believe you are safe in calling this J. janthina, and putting the other names in synonymy."

Dr. A. Myra Keen advises (Per. Comm. Aug. 45) " J. ceruleata is a misspelling. It should be J. caeruleata. The type locality is not San Diego. Reeve said, " Hab. ---?" Reeve's illustration is no more informative than his description,and I do not know what basis Dr. Dall had for reporting the species from San Diego."

Miss Viola Bristol of the San Diego Museum reports " Our specimens so named and aside from Florida, we have them from: Tres Marias Islands, Mex. (Lowe); San Ignacio Island, W. Mexico (Lowe); Manzanillo (Lowe); Hawaiian Islands etc."

Mr. A.G. Smith contributes an interesting note on this genus as follows: Janthina (sp.?)- My niece found a single specimen of a small bicolored species, not referable to either of the above. I have the shell but can't name it. It came from near Bodega Bay.

And in leaving this genus the following comments by Dr. Joshua L. Baily Jr. are of interest (Per. Comm. Aug. 1945) " There are two other matters that need investigation in this genus. It is a well known fact that the axis of the nepionic whorls of this genus is not in line with the axis of the adult whorls. In J. trifida the nucleus is tilted at a slight but distinct angle, but in J. janthina it is at right angles to that of the later formed whorls. Somewhere I have read that the nucleus is sinistral. I have gone through all my own books to find where I read that, but have not been able to locate the citation. If you can find out where that statement was made I would greatly appreciate being told about it. Also I would like to suggest that California collectors be on the lookout for specimens containing the eggs so that a microscopic examination of the embryos might be made.

The other matter concerns the gills. Every illustration of Janthina that I have ever seen shows very distinctly two rows of pectinations. This means that either there is a single bipectinate gill or a pair of monopectinate gills. In either case this is in conflict with the taxonomic position of Janthina in the Monotocardia, which have only a single monopectinate gill. I would suggest that collectors examine the gills of these animals to see if they are paired. If so, a serious alteration of taxonomy seems to be needed."

Genus Recluzia Petit De La Saussaye,1853.

This genus has never been reported from California but the following two species are known from the southern fauna.

Recluzia rollandiana Gray (Gulf of California)
Recluzia insignis Pilsbry and Lowe,1932 (Acapulco to Panama).

Family EULIMIDAE (MELANELLIDAE)

The most important reference to give on this group is " Monograph of West American Melanellid Mollusks" by Paul Bartsch, Proc. U.N. Natl. Mus. no.2207, vol.53, pp 295-356, pls. 34-49,1917. However, there will be some important changes in nomenclature based largely upon the paper by Winckworth, R., Journal of Conchology, vol. 20, no.1, pp. 12-13, May,1934. Winckworth's conclusions have been very generally accepted and were followed by Dr. A.M. Keen ,1943, Trans. San Diego Soc. vol.10, no.2, p.43 as well as by other recent authors.

Dr. A.M. Keen advises (Per. Comm.) " Among authors following Winckworth is Keen,1943. I concluded that Eulima is the name for the elongate forms now known as Strombiformis and Balcis the name for Melanella Auct. Flexing of shells seems so variable I did not try to take it into account. Possibly one might use the subgenus Vitreolina Monterosato,1884. Type (fide Winckworth,1932, Jour. Conch. vol.19, p.225), Eulima incurva Bucquoy, Dautzenberg, and Dollfus."

Dr. Joshua L. Baily Jr. agrees (Per. Comm. Aug. 1945) " Finally, I agree with you that the shells which we formerly called Eulima will now have to be called Balcis. I do not know whay the name Eulima should be transferred to what we used to call Strombiformis, but I presume it must be the result of the discovery of an earlier type designation. Other people have reached the same conclusion and it is probably correct. Since the name Eulima is restored to good standing, even though another genus the family must be called Eulimidae. The name Balcis will then be used for both the straight and the flexed shells of what was Eulima. The distinction is of small importance, as a subgeneric name is not needed."

Genus Balcis Leach in Gray,1847. Type (by monotypy): Balcis montagui Leach in Gray = Strombiformis albus Da Costa,1778.

" The genus as here constituted embraces the white polished mollusks that have the last whorl produced and the inner lip appressed for its entire length, or at least for the greater part of its length, to the attenuated base. The shells may be straight or flexed." (Bartsch for Melanella, 1917).

We will first give a key to species and list from Mr. A.M. Strong's notebook and then take up a detailed discussion of the species reported north of San Diego.

Balcis

Shell straight
. Shell 5 mm. or more in length
.. Periphery more or less angulated
... Outer lip protracted in the middle Pt. Hipolito ... baldra Bartsch
Proc. USNM 53, p. 334, pl.37, fig. 2
... Outer lip not protracted in the middle
.... All whorls slightly rounded Galapagos .... ochsneri Bartsch
Proc. USNM,53, p. 305, pl. 31, figs. 1, ,
.... Lower whorls flattened Lower Calif. .... oldroydi Bartsch
Proc. USNM 53, p. 309, pl.36, pl. 5,6,7.
.. Periphery rounded
... Shell broadly conic
.... Shell about 20 mm. in length Gulf of Calif. .... dalli Bartsch
Proc. USNM 53, p. 302, pl.35, fig.5
.... Shell about 7 mm in length Gulf of Calif. .... compacta Carpenter
Proc. USNM, #.53, p. 314, pl.37, fig.3
... Shell elongate conic
.... All whorls rounded
..... Microscopic sculpture distinct Pt. Abreojos ....hemphilli Bartsch
Proc. USNM, 53, p. 313, pl.37, fig.6
..... Microsculpture indistinct Panama .... clodia de Folin
Proc. USNM 53, p. 318, pl.39, fig.1
.... Lower whorls flattened
..... Shell exceedingly slender
...... Shell 10 mm. or more in length Panama ..... recta C.B. Adams
Proc. USNM 53, p. 311, pl.39; fig.3
...... Shell about 7 mm in length Lower Calif. ....rutila Carpenter
Proc. USNM 53; p. 306, pl.35; fig. 2,3,6
..... Shell not exceedingly slender
...... Shell about 12 mm. in length Lower Calif. .... micans Carpenter
Proc. USNM 53, p. 303, pl. 34, fig. 1,6
...... Shell about 6 mm. in length Gulf of Calif. .... mexicana Bartsch
Proc. USNM 53, p. 315, pl.37, fig.5
. Shell less than 5 mm. in length
.. Periphery more or less angulated
... Base very short Panama .... panamensis Bartsch
Proc. USNM 53, p. 311, pl.36, fig.1
... Base moderately long
.... Shell rather stout Gulf of Calif. .... retexta Carpenter
Proc. USNM, p. 311, pl. 38, fig.1

(con.)

.... Shell very slender Gulf of Calif. .... *linearis* Carpenter
Proc. USNM 53, p. 310, pl.36, fig.4

.. Periphery rounded

... Shell broadly conic Gulf of Calif. .... *producta* Carpenter
Proc. USNM 53, p. 318, pl.39, fig.5

....Shell elongate conic

....Shell not exceedingly slender

..... Periphery of last whorl inflated Panama .... *solitaria* C.B. Adams
Proc. USNM, p.308, pl.35, fig.4

..... Periphery of last whorl not inflated

...... All whorls rounded Pt. Abreojos .... *abreojosensis* Bartsch
Proc. USNM 53, p. 316, pl.40, fig 4

...... Lower whorls flattened Ecuador .... *olssoni* Bartsch
Proc. USNM 66, p.8, pl.2, fig.4

Shell flexed

. Shell 5 mm. or more in length

.. Shell flexed in a single direction

... Periphery more or less angulated Sansonata,Mexico.. *bipartita* Morch
Proc. USNM 53, p.331, no fig.

... Periphery rounded

.... Shell broadly conic Lower Calif. .... *thersites* Carp.
Proc. USNM 53, p. 323, pl.41, figs. 1,2,3

.... Shell elongate conic Lower Calif. .... *peninsularis* Bartsch
Proc. USNM 53, p. 320, pl.39, fig.4

.. Shell flexed in two directions

... Periphery more or less angulated

.... Shell exceedingly slender Lower Calif. ....*catalinensis* Bartsch
Proc. USNM 53, p 329, pl.40, fig.7

.... Shell not exceedingly slender Acapulco ...... *falcata* Carpenter
Proc. USNM 53, p. 327, pl.42, fig.6

... Periphery rounded Lower Calif. .... *grippi* Bartsch
Proc. USNM 53, p. 327, pl.42, fig.5

. Shell less than 5 mm. in length

.. Flexure confined to the tip

... All whorls rounded Pt. Abreojos .... *halia* Bartsch
Proc. USNM 53, p. 322, pl.40, fig.2

... All whorls not well rounded

.... Lower whorls slightly rounded Ecuador .... *elenensis* Bartsch
Proc. USNM 66, p.9, pl.2,fig.5

.... Lower whorls flattened Gulf of Calif. .... *townsendi* Bartsch
Proc. USNM 53, p. 323,pl.40, fig.1

.. Flexure not confined to the tip

... Flexure slight

.... Periphery of last whorl inflated Ecuador .... *tia* Bartsch
Proc. USNM 69,p.17,pl.3, fig.1

.... Periphery of last whorl not inflated

..... Base moderately long Ecuador .... *copa* Bartsch
Proc. USNM 69, p. 17, pl. 3, fig.2

..... Base short Lower Calif. .... *lastra* Bartsch
Proc. USNM 53, p 321, pl.40, fig.3

... Flexure distinct

.... Flexure in a single direction

..... All whorls rounded Panama .... *adamantina* de Folin
Proc. USNM 53, p. 331, pl.42, fig.1

..... Lower whorls only slightly rounded

...... Periphery weakly angulated Pt. Abreojos ... *cosmia* Bartsch
Proc. USNM 53, p. 322, pl.40, fig. 6

...... Periphery well rounded Gulf of Calif. .... yod Carpenter
Proc. USNM 53, p. 330, pl.40, fig.9
.... Flexure in two directions
..... Last whorl greatly swollen Panama .... gibba de Folin
Proc. USNM 53, p. 332, pl.43, fig.2
..... Last whorl not greatly swollen
...... Periphery obscurely angulated Panama .... iota C.B. Adams
Proc. USNM 53, p. 332, pl.40, fig.5
...... Periphery rounded
.... Shell exceedingly slender Pt. Abreojos ...... taravali Bartsch
Proc. USNM 53, p. 328, pl.42, fig.2

Balcis micans (Carpenter),1864	Vancouver to Pt. Abreojos
Balcis rutila (Carpenter),1864	Vancouver to Magdalena Bay
Balcis oldroydi (Bartsch),1917	San Pedro to Pt. Sbreojos
Balcis hemphilli (Bartsch),1917	San Diego to Gulf of Calif.
Balcis californica (Bartsch),1917	Catalina to San Martin Island
Balcis compacta (Carpenter),1864	San Pedro to Pt. Abreojos
Balcis baldra (Bartsch),1917	Pt. San Hipolito
Balcis mexicana (Bartsch),1917	Gulf of California
Balcis dalli (Bartsch),1917	Gulf of California
Balcis linearis (Carpenter),1858	Gulf of California
Balcis abreojosensis (Bartsch),1917	Pt. Abreojos
Balcis producta (Carpenter),1863	Mazatlan
Balcis retexta(Carpenter)1858	Mazatlan
Balcis rosa (Willett),1944	off Redondo Beach, Calif.
Balcis bipartita (Morch),1860	West Mexico
Balcis solitaria (C.B. Adams),1852	Panama
Balcis panamensis (Bartsch),1917	Santa Rosa Island to Lower Calif.
Balcis lastra (Bartsch),1917	San Pedro to Magdalena Bay
Balcis grippi (Bartsch),1917	San Pedro to Pt. Abreojos
Balcis berryi (Bartsch),1917	Monterey to Catalina
Balcis bakeri (Bartsch),1917	San Diego
Balcis yod (Carpenter),1857	Mazatlan
Balcis cosmia (Bartsch),1917	Pt. Sbreojos
Balcis hallia (Bartsch),1917	Pt. Abreojos
Balcis taravali (Bartsch),1917	Pt. Abreojos
Balcis townsendi (Bartsch),1917	Gulf of Calif.
Balcis falcata (Carpenter),1864	Acapulco, Nicaragua
Balcis iota (C.B. Adams),1852	Panama
Balcis adamantina (de Folin),1867	Panama
Balcis gibba (de Folin),1867	Panama
Balcis capa (Bartsch),1926	Ecuador
Balcis tia (Bartsch),1926	Ecuador
Balcis enonensis (Bartsch),1924	Ecuador

Balcis rosa (Willett),1944. Bulletin So. Calif. Acad. Sci. vol. 43, pp. 71-73, pl.14, fig.2. Off Redondo Beach, Calif. in 125 fathoms.

The original description follows:

" Shell imperforate,slender, straight except for an almost imperceptible inclination of the first four whorls to the right. Whorls 12, increasing in diameter very slowly; the last whorl proportionately very high and usually straight along the sides. Sutures appressed, obscure. Aperture narrow and high, very acutely angled above. Outer lip normal; inner lip reflected over and appressed to the base and continuing to join the outer lip. Color bluish-white, except where the brownish animal shows through.

The unique type, No. 1075 Los Angeles County Museum, was dredged by John Q. and Tom Burch in 125 fathoms, off Redondo, California. It measures Long. 11, lat. 2.5 mm.

In shape this species is similar to some of the more slender specimens of M. rutila Carpenter, but it is very much larger than that shell. It differs from M. micans Carpenter in more slender shape (nearer parallel s sides), and proportionately much higher aperture and last whorl.

The species is named for Mrs. Rose Burch, wife of the senior collector and mother of the junior."

Balcis portlandica (Bartsch),1927. Proc. U.S.N.M., no. 2660, vol.70, art. 11, p.4, pl.1, fig.6. Type locality, Portland, Oregon and known only from type. Dr. Bartsch in the original description makes the statement " The type .... was donated by Mrs. I.S. Oldroyd and was collected at Portland, Oregon." Of course, there is something very wrong here because as pointed out by Mr. A.G. Smith and others Portland, Oregon is on the Willamette River and a long way from the Oregon coast and the Willamette River is certainly running fresh water.

Balcis montereyensis (Bartsch),1917. Ketchikan, Alaska (Willett) to Monterey Bay. Type locality, Monterey, Calif.

Collecting data: Ketchikan, Alaska (low tide) (G. Willett); off Monterey in 20 fms. on shale bottom (Burch); 10 to 15 fms. in Monterey Bay, rare (A.G. Smith);

Balcis peninsularis (Bartsch),1917. San Diego, Calif. to Magdalena Bay, L.C. Type locality, Lower California.

Collecting data: Hipolito Point, L.C. (Hemphill) (San Diego Museum);

Balcis lastra (Bartsch),1917. San Pedro, Calif. to Magdalena Bay, L.C. Type locality, Point Abreojos, Lower Calif.

Balcis thersites (Carpenter),1864. Monterey, Calif. to San Geronimo Island, Lower Calif. Type locality, Santa Barbara, Calif.

Collecting data: Monterey, Calif. in 10 to 20 fms.; Malaga Cove, Los Angeles Co. in 10 to 15 fms.; Avalon, Catalina Island in 25 fms.; Redondo Beach, Calif. in 25 fms.; Dana Point, Orange Co. in 15 fms.; San Onofre, Calif.; Todos Santos Bay in 10-15 fms. (Burch); Monterey Bay, shore to 20 fms., common (A.G. Smith); Mazatlan (Strong); San Geronimo Island, L.C. (Lowe); So. Coronado Island in 20 fms. (Baker); La Jolla, Calif.(Chaney); San Pedro and Monterey (Lowe);

Balcis columbiana (Bartsch),1917. Baranoff Island, Alaska to Departure Bay, B.C. Type locality, Departure Bay, B.C.

Collecting data: Baranoff Island and Ketchikan, Alaska (G. Willett); Frederick Sound, Alaska in 12 fms. (Lewis) (Willett); Hoonak, Chichagoff Island, Alaska, commensal on X Fusitriton oregonense(Redfield) collected by I Norberg (Eyerdam); Petersburg, Alaska,1936 (G. Willett); Departure Bay, Vancouver, B.C. (Lowe) (San Diego Museum).

Balcis comoxensis (Bartsch),1917. Comox, Vancouver Island, B.C.

Balcis macra (Bartsch),1917. Forrester Island, Alaska to Puget Sound. Type locality, Departure Bay, B.C.

Collecting data: Forrester Island and Craig, Alaska (G. Willett); Puget Sound (Oldroyd) (San Diego Museum).

Balcis berryi (Bartsch),1917. Monterey Bay to Coronado Island, Calif. Type locality, off Del Monte, Monterey, Calif.

Collecting data: Dredged in 10 and 20 fms. off Del Monte, Monterey, Calif. and also in 10 fathoms off Pacific Grove (Burch); Cayucos,Calif. in 5 fms. (G. Willett); Monterey Bay in 10-25 fms., scarce (A.G. Smith); San Pedro, Calif. (Lowe); Del Monte in 10 fms. (Lowe); South Coronado Island, Lower Calif. (Baker- identified by Strong) (San Diego Museum).

Balcis grippi (Bartsch),1917. San Pedro, Calif. to Point Abreojos, L.C. Type locality, Newport, Calif.

Collecting data: Catalina Island in 30 fms. (G. Willett); So. Coronado Island, Mexico in 12-15 fms. (Baker); Catalina Island in 35 fms. (Lowe); La Jolla (Lowe)

Carmel, Calif. south to

Balcis catalinensis (Bartsch),1917. Santa Rosa Island, Calif. to San Hipolito Point, L.C. Type locality, Catalina Channel, dredged.

Collecting data: Off Redondo Beach, Calif. in 25 fms. gravel bottom, and in 50 fms. on N. side of submarine canyon in foraminifera bottom, and in 75 fms. and 100 fms. mud bottom; off Avalon, Catalina Island, Calif. in 35 fms. (Burch); So. Coronado Island in 15 fms. (Willett); So. Coronado Island, Mex. in 3 fms. (Baker); Catalina Island in 35 fms. (Lowe); 25 fms. off Carmel, Calif. (A.G. Smith) (extension of range northward).

Balcis micans (Carpenter),1864. Prince William Sound, Alaska (Eyerdam) south to Point Abreojos, L.C. Type locality, San Pedro, Calif.

Collecting data: Monterey, Calif. in 20 fms. shale; common off Redondo Beach in 25 fms. gravel; Venice, Calif.; Malaga Cove; Todos Santos Bay in 20 fms. (Burch); common in Pleistocene of Baldwin Hills (Burch); Strait of Fuca (Eyerdam); Lower Calif. (Oldroyd); San Diego (Hemphill and Baker); Laguna Beach (Chaney); San Pedro (Chaney, Lowe and Baker) (San Diego Museum); Monterey Bay, 5-25 fms., fairly common. Sometimes found living comensally on the under parts of starfish. (A.G. Smith).

Balcis micans borealis (Bartsch),1917. Kodiak Island, Alaska to Vancouver Island, B.C. Type locality, Comox,Vancouver Island, B.C.

Collecting data: Dredged off San Juan Islands, Puget Sound (T. Kincaid); Departure Bay, Vancouver Island (Lowe); Forrester Island, Craig, and Ketchikan, Alaska. " I think this is a synonym" (G. Willett).

Balcis rutila (Carpenter),1864. Forrester Island, Alaska to Magdalena Bay, L.C. Type locality, Montorey, Calif.

Collecting data: In our experience this is by far the most common species of the genus. Is is commensal on starfish and other echinoderms. We found them in great numbers on starfish picked up in the dredges off Monterey and Pacific Grove and also on down the coast. One rather interesting habitat was the mud flats off El Segundo and Hermosa Beach perhaps 3 or 4 miles off shore in about 25 fathoms, on the large sea cucumber, a holothurian of the genus Stichopus , is so exceedingly abundant that it is a menace to dredging and trawling because the equipment is promptly brim full of the holothurian and little else. However, the species os Balcis isas thick on those things as fleas on a dog and one dredge haul of those holothurians and you could pick off enough rutila to last a lifetime. Of course, we occasionally picked off other species of Balcis on both the holothurians and the starfish.

The bathymetric range of this species is of some interest also. We have them from almost on shore all the way down to below 100 fathoms and from every type of bottom, soft mud,soft sand,coarse sand, gravel,rocks, etc. We have often tried to detect some difference in these odd lots, but they seem to our eyes to be perfectly identical. It is a common fossil in the Pleistocene of Hilltop Quarry, Baldwin Hills, etc. (Burch). Craig, Alaska and South Coronado Island, Mexico in 15 fms. (G. Willett); Monterey Bay, 15-25 fathoms, fairly common. Also commensal on starfish (A.G. Smith).

Balcis oldroydi (Bartsch),1917. Monterey, Calif. to Point Abreojos, L.C. Type locality, San Pedro, Calif.

Collecting data: Off Redondo Beach, Calif. in 25 fms.; off Ensenada, Mexico in 15 fms.; fossil in the Pleistocene of Hilltop Quarry, Del Rey deposit of Baldwin Hills etc. (Burch); Monterey Bay in 10-25 fms., rare (A.G. Smith); Ocean Beach (Field); San Pedro in 10 fms. (Lowe); Vancouver Island, B.C. (Oldroyd) (San Diego Museum).

Balcis randolphi (Vanatta),1899. Aleutian Islands to Puget Sound. Type locality, Unalaska, Alaska under stones.

Collecting data: Dutch Harbor,Alaska (Lowe Collection); " I have most of the type specimens collected by Randolph in 1898 at Dutch Harbor. I also collected them in the same s pot in 1932 commensal on bread sponges under rocks at low tide. " (W.J. Eyerdam)

Balcis californica (Bartsch),1917. Catalina Islandand San Martin Island, Type locality, Catalina Island, Calif.

Collecting data: San Martin Island (Baker); Catalina Island (in 35 fms. (Lowe);

Balcis hemphilli (Bartsch),1917. San Diego, Calif. to Mazatlan,Mexico. Type locality, Point Abreojos, L.C.

Collecting data: Pt. Abreojos (Hemphill); Mazatlana nd La Paz (Lowe) (San Diego Museum)

Balcis compacta (Carpenter),1864. San Pedro to Point Abreojos, L.C. Type locality, San Pedro to San Diego.

Collecting data: Pt. Abreojos (Hemphill); San Martin Island (Baker) (San Diego Museum)

Balcis tacomaensis (Bartsch),1917. Forrester Island , Alaska to Tacoma, Wash. to Crescent City, Calif. (Chace). Type locality, Tacoma.

Collecting data: Point St. George, north of Crescent City (Chace); Crescent City, Calif. (Lowe);

Genus Sabinella Monterosato, 1890. Natur. Sicil. 1890, p.15
Type , Sabinella piriformis Brugnone.

" Shell conic, polished, without color markings, whorls rounded, aperture large, inner lip not appressed to the attenuated base, outer lip decidedly expanded " (A.M. Strong).

Sabinella bakeri Bartsch,1917. San Diego.

Sabinella ptilocrinicola (Bartsch),1907. U.S.S. Albatross Sta. 3342, in 1,588 fms. off British Columbia, commensal on crinoids.

Mr. Strong lists the following species from the southern fauna:

Sabinella opalina de Folin,1867.	Panama
Sabinella chathemensis Bartsch,1917	Galapagos
Sabinella meridionalis Bartsch,1917	Galapagos

Genus Entocolax W. Voight,1888. Type E. ludwigi Voight

Mrs. Oldroyd stated that she had been unable to get the description of either this genus or species. Dr. A. Myra Keen has supplied us with this information (Per. Comm. Aug. 1945) " On a separate sheet are some notes on Entocolax . I did not try to copy the original description. However, at the end there is a brief summary of the new species which I have copied . The entire article (pp. 658-685) is one long verbose description."

Thiele " Handbuch der Syst. Weich.",1929 supplies figures of the animal and a description of the genus in German, of course, which follows:

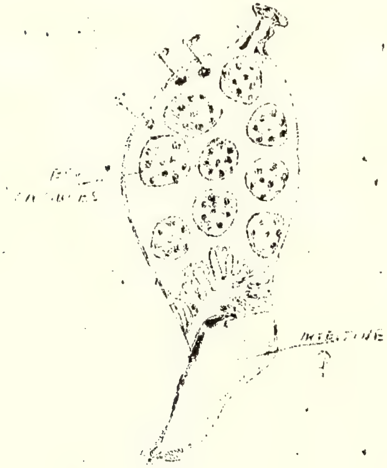
" Die Korperform erinnert an die von Gasterosiphon, das Tier ist durch ein kurzes Rohr (Sipho) an der Darmwand des Wirtes befestigt, am entgegengesetzten Ende findet sich der in einen Blinddarm fuhrende Russel, uber ihm liegt ein gelap ted Ovarium, dessen Ausfuhrungsgang in einen weiten Hohlraum mundet, in dem Eierballen abgelegt sind, die umgebendeWandung durfte einen Scheinmantel darstellen; durch den Sipho gelangen die Eier in den Darm des Wirtes. Die Geschlechter sind getrennt, die Mannchen sind sehr klein, rundlich, deren Organe bis auf den eiformigen,mit einem kurzen Ausfuhrungsgange versehenen Hoden rudimentar sind, sie halten sich in der Bruthohle des Weibchens auf."

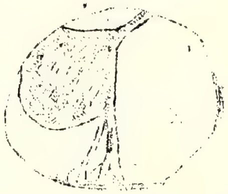
Thiele places this genus in a separate family Entoconchidae

Entocolax ludwigi Voight,1888. Bering Sea, parasite of Myriotrochus.

Original description (p. 685) " Mannchen unbekannt. Der Korper des erwachsenen Weibchens bildet einen 1 cm. langen,vorn gleich weiten, am Hinterende verjungten Schlauch, der eine kurze, strecke hinter seinem Vorderende zu einer grossen 3 mm. dicken Kugel aufgetrieben ist, welche die Eier enthalt. In Myriotrochus rinkii, Behringsmeer. Sitzt innen an der Liebeswand der Holothurie."

Type locality: Bering Sea, in intestine of the holothurian Myriotrochus.





Traced from Thiele. Voight had overlooked the males among the egg capsules.

Genus Entoconcha J. Muller,1852. Type E. mirabilis J. Muller

Shell obovate, smooth; spire short, very obtuse apex not elevated, whorls rapidly increasing; aperture transverse, semilunar, angulated above, rounded below,width almost equalling the height, margins disunited, the columellar margin straight. Operculum non-spiral." Found on Synapta digitata one of the Holothuridae at Trieste. This is probably the larval stage of some mollusk. " (Tryon, S & S. Conch.,1883, p.331).

Professor Trevor Kincaid of the University of Washihgton sent us a vial of these animals preserved in alcohol taken from the circumoral region of the large holothurian Stichopus californicus. In our Minutes #17, p.4, Nov. 1942 we ran an account of the finding of those parasites written by Professor Kincaid. Some work had been done on the species by the late Professor J.E. Guberlet.

Later in our Minutes #21, p.3, March,1943 we ran another article on this genus by P.J. Van Beneden.

A review of our first report of this new genus and species to our fauna follows: Sept. 21,1942- I spent the summer at Friday Harbor in the San Juan Islands where the University of Washington maintains its oceanographical laboratories. During the summer we utilized to some extent the large red sea cucumber, Stichopus californicus as an element in our commissary. The muscular tissue of the animal can be made into an excellent soup or chowder. In opening up large numbers of the cucumbers we occasionally encountered the strange parasitic gastropod, Entoconcha. It appears as a long worm-like organism attached at one end to the circumoral region of the echinoderm. No one would dream of its affinities since all gastropod features are absent, but the body cavity contains embryos in various stages of development, and the more advanced ambryos were found to be typical veliger larvae looking very much like those of the sea slugs."

" Your letter of Sept. 25 is at hand. I will send you a specimen of Entoconcha for your collection. It will look odd in a cabinet and the ordinary conchologist would probably tear his hair trying to figure out what to do with it, since it has no sign of a shell in the adult stage. The larval form, however, of which I will send you a prepared slide is a dead ' give away' since the little chap is a typical veliger and is provided with a beautiful curved larval shell and even has an operculum. "

Animal Parasites and Messmates- by P.J. Van Beneden (published in 1876) (copied from paragraphs on pages 158-159) " We do not know if this is the place to speak of an animal which excited great attention some years ago, and which was thought to prove the transformation of animals into each other. It is a parasite which, under the form of a gasteropod, lives under peculiar conditions. It is known by the name of Entoconcha. Discovered by J. Muller in an echinoderm of the genus Synapta , its complete development has been vainly sought to be discovered since that time. It is evidently a gasteropod mollusc, allied to the Natices, and lives in the interior of the body of a Synapta, but we do not yet know all the phases of its evolution. It was at first thought that we had before us an echinoderm in the act of trahsformation. I wrote J. Muller immediately after the discovery which he hastened to announce to me, to state that in my opinion, this was only a new instance of parasiticism; parasited are, however, so rare in this class of animals, and their mode of life is so exceptional, that one ought not to be surprised that this fact did not receive at first its true interpretation."

" Professor Semper found at the Philippine Islands, in the Holothuria edulis another species of Entoconcha which appears to attach itself to the anal vent of this echinoderm. He gave it the name of Entoconcha mulleri. We have in it a new example of the relations which certain parasites bear to their hosts, and which are the same in both hemispheres."

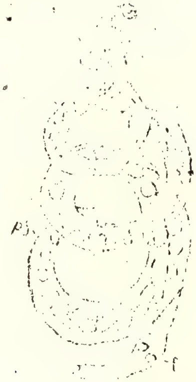
(con.)

Entoconcha mirabilis J. Muller,1852. Puget Sound in the circumoral region of Stichopus californicus.

It is possible that this will prove to be a new species. However, the animal fits the description and the figure in Thiele,1929, p.231. The figure is traced below.

Professor Kincaid writes " In regard to Entoconcha I will loop up the literature more thoroughly than I have done up to this time and see what can be done about this obscure organism."

Traced from Thiele



Genus Cythnia Carpenter,1864. Dr. A. Myra Keen advises (Per.Comm.) Type (monotypy) C. asteriaphila Carpenter. This has been variously misspelled, and under the misaprehension that it was homonymous, Dall suggested renaming it Cythnoa. There is no prior Cythnia,however, so far as I can determine."

" Imbedded in starfish like Stylifer, from which it is distinguished by its normal nuclear whorls, and thin concentric operculum." (Tryon S. & S. Conch.)

Cythnia albida Carpenter,1864. Southern California. Parasitic on Starfishes. (Dall).

Dr. A.M. Keen advises " The type locality of albida is San Diego, according to the holotype label in the U.S. National Museum, no. 15569."

None of our members report having taken the species.

Genus Haliella Monterosato,1878. Type (fide Winckworth,1932), Eulima stenostoma Jeffreys.

" Shell elongate conic, straight, smooth, polished, aperture ovate, the inner lip with twist giving the appearance of an obsolete fold."

Haliella abyssicola Bartsch,1917. In 822 fathoms off San Diego, California and southward to latitude 27 north, off Point Pablo, Lower Calif. in 284 fathoms. (Dall). The date was published in Bull. 112 in error as 1908.

Haliella lomana Dall,1908. Off Point Loma, San Diego County, Calif. in 650 fathoms.

Genus Eulima Risso,1826. Type (by subsequent designation Hermannsen,1846) Turbo subulatus Donovan = E. glabra (da Costa)

In synonymy, Strombiformis auct. The above fide Winckworth, Journ. of Conch., vol.20, no.1, pp. 12,13 1934.

" Very attenuated, slender Melanellids, with very narrow elongated aperture, having the inner lip appressed to the attenuated basal portion of the preceding whorls; marked with one or more spiral color bands." (Bartsch).

The following key to species and list covering the coast is adapted from Mr. A.M. Strong's note book. Mr. Strong uses Strombiformis. Following the list we will take up a discussion of our species north of San Diego.

Shell with color markings, inner lip appressed to the base .. Eulima
. Shell with varical lines or axial colored streaks
.. Shell over 10 mm in length
... Lower whorls slightly rounded
.... Surface chalky white (fossil)
10 whorls, 12 x 2.5 mm. Santa Monica Pleistocene ... riversi
... Lower whorls flattened
.... Light brown with two chestnut brown spiral bands
13 whorls, 11.5 x 2.1 mm. Catalina to San Diego .. californica
.... Flesh colored, with 3 pale brown spiral bands
13 whorls, 11 x 2.5 mm. Gulf of Calif. .... townsendi
.. Shell less than 10 mm. in length
... Lower whorls slightly rounded
.... Shell broadly elongate conic
..... Bluish white, with a band of light chestnut brown
10 whorls, 7 x 1.8 mm. San Pedro to San Diego ...... almo
.... Shell elongate conic
..... White Central America .... acuta
... Lower whorls flattened
.... Shell broadly elongate conic
..... With irregular, triangular streaks of brown
9 whorls, 3.1 x 1.1 mm. Pt. Abreojos .... hemphilli
.... Shell slenderly elongate conic
..... Flesh colored with a broad light and 2 dark brown bands
13 whorls, 7.8 x 1.3 mm. Gulf of California ...... lapazana
..... Upper whorls white, lower pale brown with a darker suture
11 whorls, 6 x 1.3 mm. Panama .... panamensis
. Shell without varical lines or colored axial streaks
.. Lower whorls well rounded
... Spotted along the suture with triangular reddish dots
11 whorls, 3.3 x 1.5 mm. Panama .... proca
... Two spiral bands of yellow and white spots
10 whorls, 5 x 1.5 mm. Panama .... elegantissima
.. Lower whorls flattened or very slightly rounded
... Shell broadly elongate conic
.... Shell yellowish white
7 whorls, 4.2 x 1.4 mm. Unalaska .... alaskensis
.... Light yellow, tip and middle of base brown
9 whorls, 2.7 x 0.9 mm. Gulf of California ... barragei
... Shell elongate conic
.... Anterior third of whorls dark brown
10 whorls 4.7 x 1.3 mm. Cape San Lucas ...... fuscostrigata

.... Uniformly pale brown
11 whorls 5 x 1.3 mm. Santa Maria Bay .... barthelowi
.... Colors various, white or brown, streaked or mottled
Central America .... varians

Eulima californica (Bartsch), 1917	Catalina to San Diego
Eulima almo (Bartsch), 1917	Santa Rosa Island to San Diego
Eulima fuscostrigata (Carpenter), 1864.	Cape San Lucas
Eulima barthoelowi (Bartsch), 1917	Santa Maria Bay
Eulima hemphilli (Bartsch), 1917	Pt. Abreojos
Eulima burragei (Bartsch), 1917	Gulf of California
Eulima townsendi (Bartsch), 1917	Gulf of Calif. to Nicaragua
Eulima lapazana (Bartsch), 1917	La Paz
Eulima jacula (Pilsbry & Lowe), 1932	Mazatlan
Eulima varians (Sowerby), 1834	Central America
Eulima acuta (Sowerby), 1834	Central America
Eulima panamensis (Bartsch), 1917	Panama
Eulima proca (de Folin), 1867	Panama
Eulima elegantissima (de Folin), 1867	Panama
Eulima salsa (Bartsch), 1926	Ecuador
Eulima paria (Bartsch), 1926	Ecuador
Eulima hua (Bartsch), 1926	Ecuador
Eulima inca (Bartsch), 1926	

Eulima californica (Bartsch), 1917. Santa Cruz Island and Redondo Beach (Burch) to Todos Santos Bay (Burch). Type locality, dredged in San Diego Bay.

Grant and Gale, 1931 placed this species in the synonymy of raymondi Rivers, 1904, Bull. So. Calif. Acad. of Sci. vol.3, no.5, p.70, May, 1904. They also included riversi Bartsch, 1917. Grant and Gale were of the opinion that the Recent species californica is identical with Rivers fossil species and some of us accepted their conclusion. However, Mr. A.M. Strong advises us on this matter and we are following Strong on this. Mr. Strong stated (Per. Comm. Aug. 1945) " I have a topotype of this species and do not think it is the same as californica Bartsch. The first with 10 whorls minus the nuclear whorls (discussing riversi Bartsch) probably a matter of less than a mm. is 12 mm. in length, and the ratio of diameter to length is 1 to 4.1. In the second the figure also shows the tip broken and it is stated to have 13 whorls measuring 11.5 mm. with a ratio of diameter to length of 1 to 5.5. I do not have the measurements of raymondi Rivers, but the locality seems to be the same, Pleistocene of Santa Monica. Dr. Clark relocated this place and I think is the only one to have collected there. Perhaps the name has been wrongly used for shells from other localities which are more like californica. The colors are used largely in distinguishing a species in the genus and of course we know little about the colors in the fossil."

Collecting data: Santa Cruz Island in 50 fms.; Redondo Beach in 50 and 75 fms.; Ensenada, Todos Santos Bay in 50 fms. (Burch); Catalina Island in 30 fms.; Long Beach in 20 fms.; Newport Bay in 20 fms. (Lowe);(San Diego Museum).

Eulima alaskensis (Bartsch), 1917. Dutch Harbor, Unalaska, Aleutians

Eulima almo (Bartsch), 1917. Santa Rosa Island to San Diego. Type Loc. " in 53 fms. off Sta. Rosa Id. on fine gray sand and mud bottom"

Collecting data: San Diego in 60 fms. (Kelsey) (San Diego Museum).

Genus Aclis Loven,1846. Type (by monotypy), Alvania supranitida Wood(Pliocene, England).

" Shell minute, like Turritella; usually spirally striated; apex sinistral; aperture oval; outer lip prominent; axis slightly rimate. Operculate."(Loven).

There seems to be any number of questions to be answered by the student of this group. Carpenter in the Mazatlan Catalogue says " In this genus are deposited smooth or slightly sculptured shells; with more or less numerous whorls, tumid or loosely spiral, the apex sinistral, and the mouth rounded or oval, without plait."

Mr. A.M. Strong comments on the above as follows " A sinistral apex is not mentioned in the description of any west coast species. Oldroyd places the genus in Melanellidae, Carpenter lists it just ahead of Eulima, but Bartsch does not include it in his paper. I have no idea where it belongs and it is doubtful if any west coast species really belongs in the genus. We have never recognized any of the species listed in the genus and as far as is known none of them have been figured."

Subgenus Aclis s.s. The following species have been described under this name.

Aclis turrita (Carpenter),1864. San Pedro, Calif. to San Diego,Calif. Type locality, San Pedro, Calif.

Dr. A.M. Keen in " Abridged Check List" refers to Alabina following both this species and the following, and comments on them as follows (Per. Comm. Aug.45) " Aclis turrita was taken at San Diego by Kelsey. Bartsch classified both turrita and occidentalis as Alabina in 1911 (Proc. USNM, v. 39, p.410). What they really are I don't know; apparently Dr. Bartsch was'nt sure."

Aclis occidentalis (Hemphill),1894. San Diego, Calif.

Subgenus Graphis Jeffreys,1867. Type (by monotypy), Turbo unicus Montagu.

Aclis shepardiana (Dall),1919. San Pedro to San Diego, Calif. Type locality, San Pedro, Calif.

Collecting data: Our only collecting report on this species comes from Mr. Allyn G. Smith " I collected a single specimen in the drift at White's Point."

Aclis californica Bartsch,1927. San Clemente Island. Proc. USNM, no. 2660, vol.70. Type locality " on rocks at San Clemente Island".

Collecting data: We have specimens so labelled fossil from the Pleistocene of the Lomita gravel pits, but no Recent specimens. (Burch).

The following species have been described from the southern fauna.

Aclis fusiformis (Carpenter),1857.	Mazatlan
Aclis tumens (Carpenter),1857.	Mazatlan.

Genus Niso Risso,1826. Type (by monotypy), N. eburnea Risso.

" Shell broadly conic or elongate conic; deeply umbilicated; smooth or indistinctly varicous; unicolor or with longitudinal stripes or markings." (Strong).

Niso lomana Bartsch,1917. Santa Rosa Island to Point Loma,Calif. Type locality, in 48 fathoms off Santa Rosa Island.

Niso hipolitensis Bartsch, 1917. San Diego, Calif. to San Hipolito Point, L.C. Type locality, San Hipolito Point, L.C.

Mr. A.M. Strong in his notebook lists the following additional species from the southern fauna.

Niso excolpa Bartsch, 1917.	Gulf of California
Niso splendidula (Sowerby), 1834	Panama to Ecuador
Niso interrupta (Sowerby), 1834	Panama
Niso imbricata (Sowerby) 1834	Ecuador

Mr. A.M. Strong lists the following genera and species from the southern fauna.

Genus Lambertia Souverbie, 1869. Type, L. montrouzieri Souverbie.
Lambertia cookeana Bartsch, 1917. Lower California

Genus Scalenostoma Deshayes, 1863 Type, S. carinatum Deshayes

Mr. Strong makes an interesting comment on this genus as follows " In Bull. 68, U.S. Nat. Mus., Dall and Bartsch make this a subgenus of Odostomia and place in it two species, dotella from the Gulf of California, and rangia de Folin from Panama. In Proc. U.S. Nat. Mus. Bartsch describes an Odostomia (Scalenostoma) babylonia from San Hipolito Point. Again Bartsch in Proc. U.S. Nat. Mus. vol. 53, p. 337 makes Scalenostoma a full genus in Melanellidae and redescribes rangia and babylonia. No mention is made of dotilla and I cannot find where it goes. This does not come in our study but shows how closely things have to be checked."

Scalenostoma babylonia (Bartsch), 1912.	Point San Hipolito
Scalenostoma rangia (de Folin), 1867.	Panama

Genus Eulimostraca Bartsch, 1917. Type, E. galapagensis Bartsch

Eulimostraca galapagensis Bartsch, 1917.	Galapagos
Eulimostraca bartschi Strong and Hertlein, 1937.	off Corrientes, W. Mexico

Genus Stilifer Broderip, 1832. Type, Stilifer astericola Broderip
Stilifer astericola Broderip, 1832. Galapagos

* Note* We are bipassing the Pyramidellidae for a brief time. Mr. A.M. Strong is checking up some large lots pf material and preparing additional data on this family. It will be taken up very shortly. In the meantime we will proceed with the other groups.

Suborder Nucleobranchiata

Family Pterotracheidae

Genus Cardiapoda Orbigny, 1836. Type, C. placenta Lesson.

" Shell minute, cartilaginous; peristome expanded and bilobed in front, enveloping the spire behind." (Tryon S. & S. Conch.).

There was some discussion of the family position of this genus. Dall in Bull. 112 placed it as above, but Thiele places the genus under the family Carinariidae even though using the family Pterotracheidae. Dr. H.R. Hill was of the opinion that we should follow Dall. Dr. Joshua L. Baily Jr. commented as follows " The Pterotracheidae, if I understand them correctly, never having seen one, are so different from the other nucleobranchs as to raise the question as to whether it really belongs here. I believe it has no shell. If Cardiapoda has a shell I would place it in the Carinariidae. Dr. A. Myra Keen stated " Thiele probably has evidence to justify placing

Cardiapoda in Carinariidae."

One thing seems obvious and that is that all of these pelagic forms are badly in need of work. It is to be hoped that some of us will be able to drag some tow-nets on future ocean trips and get material to settle some of these problems.

Cardiapoda placenta (Lesson),1830. Dall and Oldroyd give the range of this species as North Pacific, Pelagic. However, Dr. A.M. Keen advises " The type locality of C. placenta is " dans les mers qui baignent des cotes de la Louvelle-Guinea"-- in other words, New Guinea, not North Pacific."

Family Carinariidae

Genus Carinaria Lamarck,1801. Type, C. cristata (Linnaeus).

" Animal having the visceral sac conical and small in proportion to the rest of the body, which cannot be withdrawn into the shell; foot elongated, fin-shaped, with a sucker, but without an operculum. Shell small in proportion to the size of the body, symmetrical, cap-shaped, thin and transparent" " Shell thin, hyaline, glassy, symmetrical, conical, compressed, with a recurved apex, a minute dextrally-spiral nucleus, and a fimbriated dorsal keel; aperture large, ovate, entire." (Suter,1913).

Carinaria punctata Orbigny,1836. North and South Pacific. Pelagic.

Dr. A.M. Keen advises " The type locality of Carinaria punctata was not given, but from the title of the work (" Voyage dans l'Amerique meridionale") one may construe it as being in the Panamic marine province.

Carinaria latidens Dall,1919. North Pacific in north latitude 43 10' and west longitude 147. Pelagic.

Family Atlantidae

Genus Atlanta Lesueur,1817. Type (by subsequent designation, Gray, 1847) A. peronii Lesueur,1817.

" Shell discoidal, fragile, transparent, compressed, carinated throughout, and capable of containing the whole animal; protoconch dextral, forming a small nucleus; aperture oval, narrow, fissured; peristome simple, sharp. Operculum subtrigonal, with a small apical nucleus, which is dextrally spiral." (Suter).

Atlanta peronii Lesueur,1817. Dr. A. Myra Keen advises " The type locality of A. peronii is definitely not " North Pacific" as Mrs. Oldroyd has it. It is, rather, lat. 19 degrees 45', long. 32 degrees 42'-- whether north or south he does not say. I assume it would be north latitude, in which case the locality would be somewhat west of Cape Verde Islands, Atlantic Ocean."

Atlanta involuta Gray,1850. Pacific Ocean. Pelagic.

The following discussion applies to this species as well as to the following six species. Dr . A. Myra Keen writes (Per. Comm. Aug.45) "As Dall explains, Gray latinized the vernacular names in the " Voyage..Bonito"; but Dall does not cite the name of the author of the latter work-Eydoux. As the only copy of the " Voyage..Bonito" of which I know is at the University of California, perhaps you can get Mr. Allyn Smith to verify my hunch that the descriptions which Mrs. Oldroyd attributes to Gray are actually from vol.2 (1852) of the text by Eydoux. Certainly they are not Gray's work, as his consists of name and figure only, the figures being traced by Mrs. Gray from Eydoux's " Atlas". I doubt very much whether the type localities of any of these are North Pacific, but one would have to consult the text of Eydoux to determine that point."

Atlanta inclinata Gray,1850. Pacific Ocean. Pelagic.
Atlanta helicinoidea Gray,1850. Pacific Ocean. Pelagic.
Atlanta brunnea Gray,1850. Pacific Ocean. Pelagic.
Atlanta gaudichaudii Gray,1850. Pacific Ocean. Pelagic.
Atlanta depressa Gray,1850. Pacific Ocean. Pelagic.
Atlanta quoyii Gray,1850. Pacific Ocean in north lat.33, west long. 135 10'. Pelagic.

Atlanta cunicula Gould,1852. Dr. A.M. Keen advises " The type locality of A. cunicula is lat. 28 degrees N., long. 178 degrees E. which is N.W. of Midway Island."

Genus Oxygyrus Benson,1835. Type, O. inflatus Benson(by monotypy).
" Shell milky, narrowly umbilicated on both sides; nucleus not visible; back rounded, keeled only near the aperture; body whorl, near the aperture and keel cartilaginous; no apertural slit; operculum trigonal,lamellar."

Oxygyrus rangii Gray,1850. ? Pacific Ocean. Off Monterey, Calif. Pelagic.
Dr. A. Myra Keen discusses this species (Per. Comm. Aug.1945) " Oxygyrus rangi " Loven" is an impossibility. I suspect that it should be: O. rangii Gray,1850, Figs. molluscous Anim., vol.4, p.101, pl.240, fig.1, traced from Atlas, " Voyage .. Bonite" (1841), pl.18, fig.25. The description that Mrs. Oldroyd quotes is probably by Eydoux, from the text of this work. Certainly it is not of Gray. The Loven reference, (which, by the way, is 1848, not 1847, and page 191, not 491) is to Atlanta rangii and is simply a figure of the radula with no description or indication of authorship.As there is a prior Atlanta rangii D'Orbigny (Voyage dans l'Amerique Meridionale,1836), Loven's illustration must either be considered to be of D'Orbigny's figure or his name is a homonym. Possibly he intended to illustrate the same form that Eydoux later described; but Eydoux' species is homonymous. Gray's usage, however, was of Oxygyrus, which would seem to save the species. ... It would be interesting to find out what D'Orbigny's species really is."

Suborder Pectinibranchiata

Family Amphiperatidae (Ovulidae)

There has been a great deal of discussion of the family name, but the unanimous opinion at this time is stated by Dr. A. Myra Keen (Per. Comm.) as follows: " It must be Amphiperatidae, as Amphiperas Meuschen,1781 has priority over Ovula Bruguiere,1789 and their respective type species are congeneric. " However, the spelling of the family name is not unanimous. Some of the problems confronting the student of the spelling are stated as follows by Dr. Joshua L. Baily Jr. (Per. Comm. Aug.45) " The case of Ovula and Amphiperas is not exactly parallel. These two names are identical synonyms, and since Amphiperas is the older, the family name must be made up from it. Ovula is Latin, and the name Ovulidae is correctly formed, but Amphiperas is Greek and I immagine others must have had the same experience with the classics I have had to judge from the variants I have seen in use. The family name has been spelled Amphiperasidae, Amphiperastidae, and Amphiperatidae has been used. At least two are wrong, but which I don't know."

The most important reference on this group is F.A. Schilder, Proc. Mal. Soc. London, 20,1932. We are following Schilders classification with few exceptions. Dr. Dall used the genus Simnia Risso,1826 with three species under Simnia s.s. - vidleri,acicularis, and variabilis; three species under the subgenus Neosimnia- barbarensis, catalinensis, and uniplicata. Thiele considered Neosimnia a section of Simnia. However, we are here following Schilder and placing the species under Neosimnia.

Genus Neosimnia Fischer,1884. Type (by monotypy), Bulla spelta Linne!

	laebbeckeana	inflexa	vidleri	avena	rufa	aequale
Length	13-23mm	16-17 mm	20 mm	7-11 mm	5-7 mm	12-14mm
Ratio of breadth	34-37 %	31-32%	33%	44-48%	33-36%	33-36%
Shape	fusiform	elongate fusiform	fusiform	ovate fusiform	fusiform	cylindrical fusiform
Dorsal striae	on top of extremities	only on extremities	only on extremities	55-65	rarely on back	only on extremities
Outer lip	involute	involute	convex	flattened	convex	flattened
Anterior 1/3 outer lip	straight	declivous	declivous	declivous	slightly curved	declivous
Denticulation	wanting	wanting	wanting	sometimes present	wanting	wanting
1st funiculum	indistinct	indistinct	indistinct	indistinct	indistinct	indistinct
1st posterior outlet	shallow	shallow	shallow	wanting	obsolete	shallow
2nd funiculum	well marked	indistinct	indistinct	obsolete	indistinct	indistinct
2nd posterior outlet	well marked	shallow	well marked	well marked	well marked	shallow
Fossula	wanting	very shallow	concave	very short	very short	short smooth
usual color	rose pink	fulvous	pink	pinkish white	pinkish white	purple

The above chart is arranged from Schilder, Proc. Mal. Soc. vol.20, 1932, pp. 46-65, pl.3,4,5. From Mr. A.M. Strong's notebook.

The following key taken from Mr. A.M. Strong's notebook may be of interest.

Back smooth or finely striated
. Shell elongate, narrow, ends bluntly produced
.. A longitudinal columellar keel, biplicate posteriorly
Length 14 mm. Monterey to Panama ....variabilis-inflexa
Reeve, pl.11,fig.56; Tryon,9 -254,pl.5,fig.44
.. Columellar keel conspicuous, undivided
Length 21 mm. Monterey to San Diego .... vidleri
Oldroyd 2-3-235

(con.)

. Shell oblong, extremities shorter
.. Columella with a raised callus margin
Length 30 mm. San Pedro to Panama .... avena
Reeve, p.11, fig. 49; Tryon, 7-255,pl.5,figs. 51-55
.. Columella smooth and rounded
Monterey to Gulf of California .... barbarensis
Oldroyd, 2-2-236
. Shell fusiform, swollen above the middle
.. Columella with a spiral fold and channel at the summit
Length 23 mm. Monterey to Gulf of Calif. .... catalinensis
Oldroyd, 2-2-235
Back with a strong spiral rib
Length 25 mm. Panama to Ecuador .... emarginata
Reeve, pl.7, fig.34; Tryon vol.7, p.251, pl.3,figs. 83-84.

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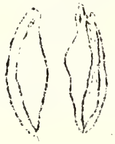
The following list of species will precede a detailed discussion.

Neosimnia loebekeana (Weinkauff),1881.		Monterey to Gulf of Calif.
var. barbarensis Dall,1892.		
var. catalinensis Berry,1916.		
Neosimnia inflexa (Sowerby),1832.	(variabilis)	Monterey to Panama
Neosimnia vidleri (Sowerby),1881.		Monterey to San Diego
Neosimnia avena (Sowerby),1832		Monterey to Acapulco
Neosimnia rufa (Sowerby),1832		California to Ecuador
Neosimnia aequale (Sowerby),1832		California to Ecuador
Neosimnia quaylei (Lowe),1935.		Gulf of California

Neosimnia loebbeckeana (Weinkauff),1881. Systematisches Conchylien-Cabinet von Martini und Chemnitz, ed.2, Bd. 5, Abt. 3. (Cypraea and Ovula) p.197,pl.50, figs. 6-7. " Testa elongata,extremitatibus productis, acutis, laevigata,nitida,aurantio-rubescens,extremitatibus modioque pallidior; apertura lata, intus carnea,canalibus brevibus,angustis; columella convexiuscula,utrinque acutissima, superne contorte subplicata,inferne leviter complanate,intus alba; labrum arcuatum,incrassatum,extus marginatum;sinus nulli. Long. 24, diam. maj.7 mm." Type locality," Vancouver -Insel--Obercalifornien--(Sowerby) Museum Loebbeckeanum."

We are indebted to Dr. A.M. Keen for the above description as well as the figures and additional data on the following species.



Collecting data: Specimens dredged off Monterey, Calif. in 20 fathoms shale bottom seem to fit the above description perfectly including one to the exact dimentions. (Burch).

Neosimnia loebbeckeana barbarensis (Dall),1892. Monterey to Gulf of California. Type locality, San Pedro, Calif.

Figured by Dall U.S. N.M. vol.15, pl.21, fig.1; Oldroyd, 2-3,pl.98, fig.4.

Collecting data: Not uncommon assosiated with gorgonian off Redondo Beach, Calif. in 35 to 50 fms., also off Rocky Point in 40 fms. (Burch); Monterey (Lowe); San Pedro and Newport (Lowe); Magdalena Bay, L.C. (Lowe) (San Diego Museum)

Neosimnia loebbeckeana catalinensis (Berry),1916. Monterey to Gulf of California (Dall). Type locality, off Avalon, Catalina Island, Calif.

in 50 fms. Figured in Nautilus 30:21; pl.5,fig.3.

There has been some difference of opinion about this species. Mr. George Willett listed it in his paper " An Upper Pleistocene Fauna from the Baldwin Hills, Los Angeles County, Calif.", Trans. San Diego Soc. Nat. Hist. vol.7, p.398,1937 in which he made the following remarks " 2 specimens in Museum collection and 2 more in White collection. Our largest measures 24 x 9 mm., and a Recent specimen in the writers collection measures 32,5 x 12 mm. When these measurements are considered, the statement of F.A. Schilder (Proc. Mal. Soc. Lon., 20,1932,p.54) that catalinensis is " evidently the young of loebbeckeana Weinkauff" would seem palpably erroneous."

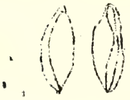
It is the personal opinion of John Q. Burch that catalinensis is a valid subspecies of loebbeckeana, but that the Monterey and northern records of it are probably typical loebbeckeana.

Dr. A. Myra Keen comments " N. barbarensis was reported at Monterey by Berry in Nautilus, vol. 21,1907, but probably his later description of catalinensis cancels this record.

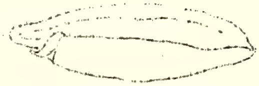
Neosimnia inflexa (Sowerby),1832. Conch. Illust., part 8, fig. 60; described, part 131,1837, p.20. Dr. Keen writes " I am transcribing Weinkauff's quotation of the original. The original was in English which Weinkauff translates to Latin): " Testa oblonga, subcylindracea, laevigata, pallida, extremitate superiori subrostrata, rostro inflexo; apertura inferne subeffusa; labrum incrassatum,columella intus carinata,superne uniplicata. Long. 16, diam. 6 mm." Weinkauff cites the locality as Gulf of Dulce (Cuming). He calls attention to the similarity of this with variabilis."

Range: Monterey, Calif. to Panama. N. variabilis(C.B. Adams)1850 in synonymy. Stanford collection sets from Pt. Abreojos to Gulf of Calif.

Collecting data: Monterey, Calif. on gorgonian (Burch); San Hipolito, L.C. and Taboga Island, Panama (Lowe).



Original figures



from Schilder,1932, pl.5, fig.61

Neosimnia vidleri (Sowerby),1881. Dr. A.M. Keen states regarding this species " The description and original illustration are copied in Oldroyd; however, her figure 8 is inverted. In line 3 of the description, " Antivelavior" should be " antice latior."The type locality is Monterey, west coast of America."

Reported from San Pedro by Lowe. Dr. H.R. Hill is of the opinion that this species equals avena.

Dr. A.M. Keen reports that the specimens in the Stanford Collection range Monterey to Sonora,Mexico.

Neosimnia avena (Sowerby),1832. Conch. Ill., pt.8, fig. 59; described, pt. 131, 1837, p.20 (fide Sherborn). Description not quoted by Weinkauff (see note above). Weinkauff's description, however, is : " O. testa oblongo-ovata,extremitatibus parum productis gibboso,spiraliter subtile striata, rubra; apertura latiuscula, inferne dilatata; columella medio convexa tenuissime labiata; intus albido-lirata,superne uniplicata,inferne angustata, intus excavata,basi acuminata; labrum incrassatum, laevigatum, pallidior, extus marginatum; sinus oblique et modice emarginati. Long. 11, diam. 4.3 mm."

(con.)

The type locality apparently is Conchaqua (Cuming). Weinkauff figures avena (p. 210, pl. 53, figs. 5,8) and cites O. neglectum " Reeve" (Conch. Icon. pl.14, fig.62), which should be of Adams, in synonymy."

Collecting data: Bahia de Adair, Sonora (E. Huffman); San Felipe, L.C. (Lowe); sets in Stanford collection range from San Diego to Panama.

Range: Monterey,Calif. to Panama.

Neosimnia rufa (Sowerby),1832. Conch. Ill. pt. 8, fig. 58; described, pt. 131,1837, p. 19. Weinkauff's latinization of Sowerby's original description: " Testa oblonga, extremitatibus subproductis, postico acuminato, rufa; apertura angusta, inferne dilatata; columella longitudinaliter depressa lirata,superne uniplicata. Long. 9, diam. 4 mm."

Orig.

Schilder

The type locality is Bay of Caracas on the West Coast of South America (i.e.,Manta,Ecuador). Weinkauff figures it (p. 213, pl. 53, figs. 13,16) and places O. lividum Reeve (Conch. Icon. pl. 14, fig.63,1865) in synonymy. Schilder confirms this synonymy."

Range: California to Ecuador.

There are specimens in the Stanford Collection from the Galapagos.

Neosimnia aequalis (Sowerby),1832. Conch. Illust., pt. 8, fig.61; described pt. 131,1837, p.20. Weinkauff's latinization of the original description: " Testa oblonga, subcylindracea, rubra, estremitatibus obtusis; apertura latiuscula, aequalis; columella intus carinata; labrum incrassatum." Type locality, Panama (Cuming).

Orig.

Collecting data: Sets in the Stanford collection ranging from San Pedro, Calif. to Panama. Dr. A. Myra Keen writes " I find that the most abundant species in our collection is aequalis (mostly labelled variabilis , which is supposed to be a synonym of inflexa). There are sets labelled aequalis from the Gulf of California in the Lowe collection in the San Diego Museum.

However, Dr. H.R. Hill is disposed to place this species in the synonymy of inflexa.

Schilder,pl.5,fig.65

Dr. Dall in Bulletin 112 and followed by Mrs. Oldroyd and others listed the species acicularis Lamarck,1811 and uniplicata Sowerby,1848. Dr. A. Myra Keen advises on these as follows:" .. both should be stricken from West Coast lists, as both are Caribbean species. Obviously we have plenty of West Coast names to cope with without importing anything from the other side of the continent. "

In the discussion of adopting the above classification the following note from Dr. A. M. Keen is of interest: " I should advise adopting Schilder's classification, as Mr. Strong does. Although Schilder was sometimes guilty of hasty conclusions, excusable considering the size of the group with which he was working, his classification in the main seems sound. I have rearranged our Cypraeidae to conform to his scheme and find that it facilitates the identification of unknown material. That seems to me a good test of workability."

Family Pediculariidae

Genus Pedicularia Swainson,1840. Type, Pedicularia sicula Swainson. " Shell small, limpet-like, irregular, with small, short spire concealed with the growth, and a radiately ribbed surface when young; mouth large, lip simple, irregular. Operculum none." (Tryon, S. & S. Conch.).

Pedicularia californica Newcomb,1864. Farallones to Monterey, Calif. The type locality is: " California, from a coral growing on a monster crustacean of the genus Echidnocerus from deep water at the Farallon Islands."

Collecting data: Monterey, Calif. (Button) (San Diego Museum).

Family Cypraeidae

Genus Zonaria Jousseaume,1884. Type Z. zonaria Gmelin,1791 =(zonata Lamarck,1810)

In accord with the discussion under Amphiperatidae above, we have elected to follow Schilder " Prodrome of a Monograph on Living Cypraeidae", Proc. Mal. Soc. London, vol. 23, part 4, march,1939. Dr. phil. F.A. Schilder and Dr. phil. nat. M. Schilder.

Subgenus Neobernaya Schilder,1927. Type (orig. desig.) Zonaria spadicea(Swainson).

Zonaria spadicea (Swainson),1823. Monterey, Calif. to Cerros Island, L.C. Type locality, California.

Collecting data: Dr. A.M. Keen advises " The northernmost record for spadicea is Monterey Bay; the late Mrs. Fackenthall collected a single living specimen there years ago.". Cambria, San Luis Obispo Co. (Wilcox); Our experience has been to find spadicea a very rare species north of Los Angeles county. It is rather abundant from Santa Monica Bay south to Todos Santos Bay, L.C. We have taken it in the estuaries as well as along the open surf. The bathymetric range indicates that it is a shallow water species although we have brought it up from as deep as 25 fms. off Catalina Island (Burch); Boca la Playa, mouth of Santo Tomas River, L.C. (Huey); End of Point Loma and Mission Bay (Wilson); La Jolla (Mills); Del Mar (Robbins); Laguna Beach (Sharkey); San Pedro (Lowe) (San Diego Museum).

The following keys and list of species from Mr. A.M. Strong's notebook should be of interest.

Family Cypraeidae

Surface ribbed	Trivia
Surface pustulate	Pustularia
Surface smooth	
. Aperture the full length of the shell	Cypraea
. Aperture shorter than the shell	Erato

Genus Cypraea

Shell cylindrical

. Back with 4 obscure lead colored bands, surface spotted
Length 75 mm Gulf of Calif. to Peru .... cervinetta
Reeve sp.6; Tryon, vol.7, p. 164, pl.2, figs. 13 and 14

. Back with irregular dark lines, ends orange spotted
Length 40 mm. Gulf of Calif. to Socorro Id. ...... mexicana
Proc. U.S.N.M. vol.16, p.348

(con.)

Shell ovate, with a flattened base
• Closely reticulated with brown, margins black spotted
Length 40 mm. Gulf of Calif. to Peru .... aribicula
Reeve, fig.60; Tryon, vol.7, p. 175, pl.9, figs. 35 & 36
Shell pyriformly ovate
• Shell marginated
•• Margins obscurely pitted.
••• Back fulvous, with white oocellated spots
Length 30 mm. Gulf of Calif. to Galapagos .... albuginosa
Reeve, fig.94; Tryon, vol.7,p.193, pl.18, figs. 98 & 99
•• Margins not pitted
••• Back closely, unequally, chestnut spotted
Length 50 mm. Gulf of Calif. to Peru .... annettae
= sowerbyi of Reeve. Tryon, vol.7, p. 185, pl.15, fig.9
••• Back freckled with chestnut, more globose
Length 40 mm. Gulf of Calif. to Peru .... robertsi
= punctulata Gray Reeve fig.61; Tryon vol.7,p.186,pl.15,figs. 28,29
• Shell not marginated
•• Back chestnut, sides livid, unspotted
Length 60 mm. Monterey to Cerros Island .... spadicea
Oldroyd 2-2-237
•• Back freckled with pale brown, sides black dotted
Length 40 mm. Panama to Peru .... nigropunctata
Reeve fig. 59; Tryon vol.7, p. 185, pl.15, fig.18 & 19

Cypraea spadicea Swainson,1823.	Monterey to Cerros Island
Cypraea annettae Dall,1909.	San Ignacio Lagoon to Peru
Cypraea cervinetta Kiener,1845.	Gulf of Calif. to Panama
Cypraea robertsi Hidalgo,1906	Gulf of Calif. to Peru
Cypraea arabicula Lamarck,1810	Magdalena Bay to Peru
Cypraea albuginosa Gray,1824	Gulf of Calif. to Panama
Cypraea isabella mexicana Stearns	Gulf of Calif. to Socorro Island
Cypraea nigropunctata Gray,1828.	Panama to Peru

Family Eratoidae
Subfamily Triviinae

The species involved here were placed by Dr. Dall in Bull. 112 under family Triviidae, genus Trivia Gray,1832. This was followed by Grant and Gale who used type by subsequent designation Gray,1847, Cypraea europea Montagu = (Voluta jonensis Pennant). However, Dr. A. Myra Keen advises (Per. Comm. August,1945) " Trivia should be credited to Broderip, 1837 (Penny Cyclopedia, p. 256). The Gray,1832, reference is to unpublished proof sheets. Genotype (subsequent designation Gray,1847), Cypraea europaea Montagu = C. monacha Da Costa,1778. However, Schilder (Fossilium Catalogus, pt. 55,1932), puts our species into the genus Pusula Jousseaume,1884; genotype, fide Schilder, P. radians (Lamarck). Tp the subgenus Pusula s.s., he assigns radians, solandri, sanguinea, and californiana. To Pusula (Dolichupis) he assigns ritteri and the Panamic forms,buttoni and panamensis. The genotype of Dolichupis Iredale,1930 is P. (D) producta(Gaskoin). "

We propose to follow Schilder's classification.

Another discussion of the proper spelling of the family name was involved. Dr. Joshua L. Baily Jr. states it as follows " Trivia is a Latin name and a family name based upon it would be correctly spelled Triviidae. But Erato is a Greek name. The International Code provides that in cases of non-Latin names the name must be either Latinized or " considered as such if not of clasical origin." But Erato is of classical origin. If treated as a Latin word the family name would be ' Eratonidae' because Latin words ending in -o take and "n" in making compounds. If it is treated as a Greek noun which it is, I do not know what the family name would be."

Genus Pusula Jousseaume,1884. Type, P. radians (Lamarck)- fide Schilder

Pusula radians (Lamarck),1810. Santa Barbara and Catalina Island, Calif. to Ecuador. Type locality, Acapulco, Mexico.

Collecting data: Mazatlan, Mex. (Lowe); Santa Elena Bay,Ecuador (Lowe). We have specimens from Panama and west Mexico (Burch).

Pusula solandri (Sowerby),1832, ex Gray MS. Conch. Illust. pt.7, fig.43; described in pt. 131,1837, p.14 (description copied in Oldroyd but wrongly attributed to Gray). Type locality, Pacific Ocean.

Collecting data: Terminal Island; Balboa; Corona del Mar; Dana Point; Newport Bay; San Diego; Pt. Vicente; an interesting collecting note seems to be that this species is in our experience more nearly littoral than californiana. We have dredged the latter at considerable depth but never solandri beyond very shallow water. (Burch). Mulege, L.C. (Hucy); Cedros Island and La Paz and numerous localities in the Gulf of California (Lowe) (San Diego Museum).

Range: Catalina Island, Calif. to Panama.

Pusula sanguinea (Sowerby),1832, ex Gray MS. Conch. Ill., pt.6, fig.32; described, pt. 131,p. 13 (p. 12 in Stanford copy): " Shell ovate, dark purplish brown, with a dark crimson blotch on the back, dorsal line short, its ends whitish; ribs rather distant, smooth,lighter coloured: length 0.45, breadth 0.30." Type locality, Panama and Mexico.

Range: Catalina Island to Peru.

Collecting data: Gulf of Calif. (Button); Puerto Angel, Oaxaqa (Orcutt); La Paz, L.C. (Baker); Mazatlan (Lowe); Panama (Anderson) (San Diego Museum).

Pusula californiana (Gray),1828. Crescent City,Calif. to West Mexico. Type locality, California.

Collecting data: By far the most common species in our fauna. We have it from a great many localities from littoral down to as deep as 40 fms. off Monterey. Common off Redondo Beach, Calif. in 25 fms. gravel. In washed in kelp holdfasts along beach from Long Beach south; in algae in the Estero below Ensenada,Mexico; littoral at Dana Pt.,La Jolla, San Onofre etc.(Burch). Anchor Bay, Mendocino Co. coast (Chaces); Punta Penasco, Sonora (Lowe); Magdalena Is.,L.C. (Orcutt); Catalina Island (Lowe); La Jolla (Bristol and Beckwith).

Subgenus Dolichupis Iredale,1930. Type, P. (D) producta (Gaskoin).

Pusula ritteri (Raymond),1903. Monterey, Calif. to Cortez Bank. Type locality, off Catalina Island in 60 fathoms.

Grant and Gale state " This rare, white species is obtained only by dredging. The ribs are continuous across the back, the species differing in this respect from T. californiana. T. sanguinea .. with which ritteri was formerly confused, is dark colored and the ribs are interrupted somewhat across the back. T. californiana has fewer and coarser ribs than either ritteri or sanguinea."

Collecting data: Dredged off Redondo Beach,Calif. in 25 fms. gravel bottom; also Pleistocene of Timm's Pt.,San Pedro (Burch); Catalina Island in 50 fms. (Lowe): 40 fms. White's Landing,Cat. Id. (Strong).

The following key and list of species from Mr. A.M. Strong's notebook will be of interest. Mr. Strong used the generic name Trivia .

Genus Trivia
Shell with a dorsal groove interrupting the ribs
. Ribs tuberculate at the dorsal extremity
.. Teeth of outer lip twice as numerous as the ribs
Length 19 mm. Catalina Island to Panama............. solandri
Oldroyd 2-2-238; Reeve; fig. 113
.. Teeth of outer lip not exceeding the ribs in number
Length 22 mm. Santa Barbara to Ecuador .... radians
Oldroyd 2-2-237; Reeve, fig. 117
. Ribs not tuberculate
.. Ribs fine, numerous, rather wrinkled
Length 10 mm. Gulf of Calif. to Panama .... pacifica
Reeve, fig. 143; Tryon vol.7,p.201,pl. 21,figs. 3 & 4
Shell with an impressed dorsal line not interrupting the ribs
. Shell ovate
.. Sides not dilated, ribs rather distant
Length 12 mm. Farallones to Mexico .... californiana
Oldroyd 2-2-238; Reeve fig. 128.
.. Sides dilated, ribs fine and numerous
Length 14 mm. Catalina to Peru .... sanguinea
Oldroyd 2-2-239; Reeve 127
.. Right side slightly thickened, ribs very fine
Length 10 mm. Gulf of Calif. to Galapagos .... fusca
Reeve fig. 134; Tryon vol.7, p. 203
. Shell pyriformly ovate, right side marginated
Length 18 mm. Galapagos .... maugeri
Reeve fig. 119; Tryon, vol.7,p. 203,pl.22,figs. 23 & 24
. Shell somewhat globular
.. Ribs rather thick, prominent but not crowded
Galapagos to Ecuador .... acutidentata
Tryon vol.7, p. 207
.. Ribs about 18, strong, smooth
Length 3.2 mm. Panama .... atomaria
Bull. Mus. Comp. Zool. vol.43, p.323,pl.12, figs. 8,9,11.
Shell without dorsal groove or impressed line
. Both ends somewhat produced
Length 7 mm. Gulf of Calif. to Galapagos .... pulla
Reeve, fig. 150; Tryon, vol.7, p. 206, pl. 23, figs. 55 & 56
. Anterior end slightly produced
Length 12 mm. Monterey to Cortez Bank .... ritteri
Oldroyd 2-2-238
. Ends not produced
.. Ribs coarse, wide spaced
Length 4.2.mm Panama ....panamensis
Bull. Mus. Comp. Zool. vol.43, p. 323, pl. 12, fig. 7,9,12
.. Ribs fine, columella sharply angled
Length 10 mm. Gulf of Calif. to Panama .... rubescens
Reeve, fig.141; Tryon vol. 7,p. 204, pl.23,figs. 44 & 47.

Trivia solandri (Gray),1832	Catalina to Panama
Trivia californiana (Gray),1828.	Farallones to Mexico
Trivia sanguinea (Gray),1832	Catalina to Peru
Trivia radians (Lamarck),1810	Santa Barbara to Ecuador

(con.)

Trivia ritteri Raymond,1903.	Monterey to Cortez Bank
Trivia fusca Gray in Sby. 1832	Gulf of Calif. to Galapagos
Trivia pacifica (Gray),1833	Gulf of Calif. to Panama
Trivia pulla Gaskoin,1846.	Gulf of Calif. to Galapagos
Trivia rubescens (Gray),1832	Gulf of Calif. to Panama
Trivia panamensis Dall,1902.	Nicaragua,Panama and Galapagos
Trivia atomaria Dall,1902.	Panama
Trivia galapagensis Melvill	Galapagos
Trivia acutidentata Gaskoin,1835.	Galapagos and Ecuador
Trivia maugeri (Gray),1833	Galapagos

Subfamily Eratoinae

Genus Erato Risso,1826. Dr. A.M. Keen advises " The genotype of Erato is E. cypraeola (Brocchi). Schilder (Fossilium Catalogus, pt.55,1932, p.83) names a new subgenus, Hespererato and designates Erato vitellina Hinds as type."

" This genus differs from Cypraea in that the spire is not entirely obscured by the extension of the aperture" (Grant and Gale, p. 754).

The following two keys and list of species from Mr. A.M. Strong's note-book will be of interest. We will then take up a detailed discussion of the species reported north of San Diego.

Genus Erato

Spire elevated
. Lip somewhat thickened, shell livid or reddish
Height 10 mm. San Francisco to Mexico .... vitellina
. Lip swollen in the middle, shell violet lead color
Height 10 mm. Gulf of Calif. to Peru .... scabriuscula
Reeve fig.4; Tryon vol.5,p.11, pl.4, fig. 56.
. Lip swollen, somewhat varicose, shell flesh color
Height 5 mm. Monterey to Panama .... columbella
Spire low, more or less covered
. Aperture wide, shell whitish, thin
Height 15 mm. Santa Rosa Island to Gulf of Calif. ... albescens
. Aperture narrow, shell pale olive green
Height 3.2 mm. Panama .... oligostata
Bull,. Mus. Comp. Zool. 43, p. 324,pl.11, fig.8.

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West Coast Species in the Subfamily Eratoinae
Adapted from Schilder in Proc. Mal. Soc.- July,1933

Fossula distinctly concave
. Terminal ridges and anterior columellar teeth radial ..... Erato
.. Second terminal ridge oblique, stronger than first ......(Eratopsis)
... Dorsum granulated on spire and body whorl
Length 3.1 to 3.3 mm. Panama .... oligostata
Fossula obsolete or nearly so .... Hespererato
. Columella and fossula smooth interiorly
.. Labial teeth more than eleven
... Extremities unspotted but often deeper colored
.... Breadth less than 70% of the length of the outer lip
Length 4.2 mm. Central America .... marginata
.... Breadth more than 70% of the length of the outer lip
Length 3.7 mm. Galapagos Islands .... galapagensis
... Extremities vividly spotted
Length 5.9 to 6.9 mm. California to Panama .... columbella

(con.)

.. Labial teeth less than eleven

... Shell reddish-brown, solid

Length 11.7 to 13.0 mm. Bodega Bay to San Diego ..... vitellina

... Shell white, subpellucid

Length 13.5 mm. Santa Barbara to La Paz .... albescens

. Columellar teeth crossing the interior of the columella

Length 6.8 to 7.9 mm. America .... scabriuscula

oligostata Dall,1902. p. 268. Gives a description.

marginata Morch,1860. p. 267, unfigured. States he has seen no specimens and the type is not preserved in the Museum of Copenhagen.

galapagensis Schilder,1933. p. 264, fig.46. Described as a variety of marginata. Says " seems to differ in relative breadth and callosity only". (Probably equals E. maugeriae Gray of west coast authors in Galapagan lists, A.M.S.).

columbella Menke,1846. fig. 47-48. E. leucophaea Gould,1852 is a synonym. E. panamensis Carp.,1856, is given by Tryon as a synonym but is stated by Smith to belong to E. voluta, a fossil. (Described as ? var. of maugeriae and is probably an older name for marginata. A.M.S.)

vitellina Hinds,1844. Fig. 49

albescens Dall,1902. p. 259, unfigured. Gives as a deep water form of vitellina.

scabriuscula Sowerby,1832. p. 271, fig. 51. Describes the granulated surface. E. granum Kiener and E. cypraeola Sby. (not Brocchi) are synonyms.

Erato vitellina Hinds,1844.	Bodega Bay to Magdalena Bay.
Erato columbella Menke,1847.	Monterey to Panama
Erato albescens Dall,1905.	Santa Rosa Island to La Paz
Erato scabriuscula Gray,1832.	Gulf of Calif. to Peru
Erato marginata Morch,1860.	Gulf of Calif. to Panama
var galapagensis Schilder,1933	Galapagos
Erato oligostata Dall,1902.	Panama

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Genus Erato Risso,1826

Subgenus Hespererato Schilder,1932

Erato vitellina Hinds,1844. Bodega Bay and Farallone Islands south to Magdalena Bay, L.C. Type locality, Magdalena Bay.

Collecting data: A fairly common species in our experience from the littoral down to below 40 fathoms. We have it from many localities: Monterey; Cayucos; dredged off Santa Monica, Catalina Island and Redondo Beach, most common around 20 to 25 fathoms; taken living littoral on Balboa breakwater, Dana Point, San Onofre, Terminal Island, La Jolla, San Diego; living in numbers in the bryozoan growth on the bait tanks off Santa Monica; in holdfasts washed in along the coast down to below San Diego. (Burch). La Jolla to Monterey (San Diego Museum).

Erato albescens Dall,1905. Off Santa Rosa Island, Calif. to La Paz, L.C. Type locality, Fish Commission station 4431, which we are informed by Dr. A.M. Keen is 30-41 fms. off western Santa Barbara Islands, Calif.

As stated above Schilder considers albescens a subspecies of vitellina. However, Mr. A.M. Strong who has dredged specimens from 30-40 fms. off White's Landing, Catalina states that albescens is a decidedly different shell in form and is a good distinct species in his opinion.

Erato columbella Menke,1847. Monterey, Calif. to Panama Bay.
Type locality, Mazatlan, Mexico.

Collecting data: We have found this not an uncommon shell. We dredged it off Monterey, Calif. on the shale off Del Monte in 20 fms.; off Redondo Beach in gravel at 25 fathoms, common; numbers taken from the roots of eel grass at Dana Point, Orange Co.; not uncommon in holdfasts washed ashore all along the coast; littoralat Punta Banda, L.C. (Burch); Mazatlan (Lowe); San Hipolito Point, L.C. (Hemphill); So. Coronado Island (Baker); Catalina Island in 50 fms. (Lowe); Newport Beach and San Pedro (Lowe); La Jolla (Bristol and Brier), (San Diego Museum of Natural History).

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George Willett

The many friends of George Willett, Curator of Ornithology and Mammalogy at the Los Angeles Museum, were greatly stunned when they learned of his death in Los Angeles on August second.

Born in Hawkesbury,Ontario,Canada on May 28th,1879, Mr. Willett moved to California in his early years and attended Whittier College from 1896 to 1898. The Spanish American war interrupted his education and he joined the Service, serving in the Philippine camapign. At the close of the war, he joined the Los Angeles Police force, where he was employed until time of retirement. In 1912, he was appointed a Reservation Inspector for the U.S. Bureau of Biological Survey and spent six years in the field, the last four years being stationed at Forrester Island, Alaska. World War I found him in Military Service again and he was at a training camp in this country when the Armistice was signed.

Returning to Alaska, a second time as U.S. Marshall, he remained in the vicinity of Ketchikan until his return to California in 1927 to accept the position of Assistant Ornithologist at the Los Angeles Museum. One year he was appointed Curator of Ornithology and Mammalogy.

As a boy, Mr. Willett loved nature in all it's aspects. Down through the years, because of his extensive travels, he had a wonderful opportunity to study animals in their native surroundings. He accumulated a great amount of knowledge concerning the structure and habits of birds, mammals and mollusks of the west and shared his knowledge with others, by word of mouth or through publications. Friendship with scientists the world over was also a potent factor in his development and he received much help and encouragement from many well known leaders in the branches of Natural History in which he was interested.

Mr. Willett was an accurate observer, a tireless collector and a careful writer. He was regarded as an authority by the rank and file of his colleagues. In recognition of this scholarship, a number of new species of animals were named in his honor. Some of these animals he himself had discovered. Many west coast mollusks were first described and named by him. The type specimens of these are deposited in the Reference Collections of the Los Angeles Museum.

The Cooper Ornithological Club of Southern California played an important part in the latter years of his life. For it was here that he found many lasting friendships. He was a Past President of this organization and was a member of its Board of Governors.

The Conchological Club of Southern California was another club in which he took an active interest, and he was scarcely ever absent from its meetings. He had been President several times in the past and was President at the time of his death.

(con.)

His curatorship at the Los Angeles Museum was eminently successful, and he was greatly admired and respected by his associates. His genial disposition and helpful attitude won for him the friendship of his fellow workers and the appreciation of those who came to him for advice and information. Especially will he be missed by the younger generation. The kind, personal instruction that he gave the high school boysand girls who attended his Saturday morning classes at the Museum, will long be remembered and there are some who owe their scientific career to his leadership and training.

There were three outstanding contributions which Mr. Willett made toward the development of the Museum's Collections of Natural History. These were extensive field trips which netted many valuable specimens to the Museum. In 1932-1933 as a guest of Dr. Herbert N. McCoy, he travelled through Guatemala and in 1936 visited parts of southeastern Alaska. At different times during the period between 1939 and 1941, he was a member of the Museum's Channel Island Survey staff which was engaged in biological studies and collections on the various islands off the coast of southern California. A dredging trip to the Gulf of California and intensive collecting at near by points resulted in a large amount of material being added to the Collections.

During his second sojourn in Alaska, Mr. Willett met and married Ora A. Bellah of Ketchikan, who likewise had a deep love of nature. Through their many happy years of married life, Mrs. Willett was an inspiration to him and a faithful companion and helper on his frequent collecting trips.

Mr. Willett was a vice-president of the American Ornithological Union and held membership in the following scientific societies besides those heretofore mentioned: Northwest Bird and Mammal Society, California Academy of Sciences, Southern California Academy of Sciences, Biological Society of Washington, American Society of Mammalogists, Society of Vertebrate Paleontology, and the San Diego Society of Natural History.

Besides the widow, Mr. Willett is survived by a son, George Willett Jr. of Oregon, the issue of a former marriage, a sister Mrs. Walter Trager of Paso Robles and a brother Fred H. Willett of Mentone, California. His funeral was held on August 7th and he was buried with military honors at the National Wat Veteran's Cemetery at Sawtelle, California.

Appended is a list of the type specimens of mollusks described by him and a complete bibliography of his writings.

Artcles on Natural History by George Willett

1895- The Mexican Raven in California. (Oologist xii,1895, p.110).
1906- Eggs of the Sage Grouse (Condor viii,1906,p.75)
Peculiarities of Ducks in Nesting. (Condor viii,1906,p.75)
The Southern California Clapper Rail Breeding on Fresh Water (Condor viii,1906,p. 151.)
1907- Summer Birds of a Prairie Lake.(Condor ix,1907, p.105)
1908- Common Tern and Ruddy Turnstone in Southern California. (Condor x, 1908,p.50).
Summer Birds of the Upper Salinas Valley and Adjacent Foothills. ((Condor x,1908, p. 137),
1909- Bird Notes from the Coast of San Luis Obispo County (Condor xi,1909,185)
1910- Additions to Grinnell's List of Birds of the San Bernardino Mountains (Condor xii, 1910, p.44)
Rodger Fulmar in Southern California (Condor xii, 1910, p.46).
A Summer Trip to the Northern Santa Barbara Islands (Condor xii,1910, p.170).
A Southern California Spring Record for the Common Tern.(Condor xii, 1910, p.174)

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Red Phalarope in Southern California in Winter.(Condor xii,1910,p.175).
Southern California Breeding Records of the Western Grasshopper Sparrow. (Condor xii,1910, p.204)
1911- The Blue-winged Teal in Southern California.(Condor xiii,1911,p.76).
(With Antonin Jay) May Notes from San Jacinto Lake.(Condor xiii,1911, p. 156).
1912- Birds of the Pacific Slope of Southern California.(Pacific Coast Avifauna 7,1912.)
Some 1912 Spring Notes from Southern California. (Condor xiv,1912,p.194)
Report of Birds of the St. Lazaria Birds Reservation,Alaska.(Bird Lore, 1912,p. 419)
1913- Bird Notes from the Coast of Northern Lower California.(Condor xv, 1913, p. 19)
Pelagic Wanderers .(Condor xv,1913, p.158).
1914- Birds of Sitka and Vicinity, Southeastern Alaska (Condor xvi,1914,p.71)
Peculiar Death of California Bush-tit.(Condor xvi,1914,p.168)
Unusual Abundance of Glaucous-winged Gulls on the Coast of Southern California (Condor xvi,1914, p.183).
1915- New Winter Records for Arizona.(Condor xvii,1915,p.102).
Summer Birds of Forrester Island,Alaska.(Auk xxxii,1915,p.295).
1917- Further Notes on the Birds of Forrester Island,Alaska.(Condor xix,1917, p.15)
Birds of East Park Bird Reservation,California.(Reclamation Record, 1917, p.33).
Birds of Rio Grande Bird Reservation,New Mexico.(Reclamation Record, 1917, p.190)
Notes on Some Mollusc-eating Birds. (Lorquinia II,1917, pp. 33-34).
1918- Bird Notes from Forrester Island, Alaska. (Condor xx,1918,p.85).
A Peculiarity of Plumage in Some Specimens of Heermann Gull.(Condor xx,1918, p. 122)
Description of a New Pandora of the Subgenus Kennerleyia.(Nautilus xxxi,1918, p.134).
Notes on the Mollusca of Forrester Island,Alaska. (Bivalves).(Nautilus xxxii, Oct,1918, pp. 65-69).
1919- Notes on the Nesting of Two Little Known Species of Petrels (Condor, xxi,1919, p.60).
Some Notes from San Diego County, California (Condor xxi,1919,p.126).
Mollusca of Forrester Island, Alaska, Univalves (with description of one new species, Velutina rubra)(Nautilus xxxiii,1919,pp.21-28).
Bird Notes from Southeastern Oregon and Northeastern California (Condor xxi,1919, pp 194-207).
1920- Additional Notes on the Avifauna of Forrester Island,Alaska (Condor, xxii, 1920, pp. 138,139).
Comments upon the Safety of Sea Birds and upon the " Probable" occurance of the Northern Bald Eagle in California (Condor xxii,1920, pp. 204,205.)
1921- Ornithological Notes from Southeastern Alaska (Auk xxviii,1921,pp 127, 129)
Bird Notes for 1920 from Southeastern Alaska (Murrelet,II,1921,pp.7-11)
Distribution of the Townsend Fox Sparrow (Condor xxiii,1921,pp.36,37).
Mammal Notes from Wrangell,Alaska (Murrelet II,1921,pp.17,18).
Bird Notes from Southeastern Alaska (Condor xxiii,1921,pp.156-159)
1923- Comments on Bent's Life Histories (Condor xxv,1923,p.25).
Bird Records from Craig,Alaska.(Condor xxv,1923,p.105)
1927- Notes on Occurence and Distribution os some Southeastern Alaskan Birds (Condor xxix,1927, p.58).

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Destruction of Eagles in Alaska (Auk. xliv,1927,p.591).

1928- Gulls (L.A. Employee, I, 1928, pp. 10,11,24)

Notes on Some Birds of Southeastern Alaska (Auk xlv,1928,pp.445-449).

Notes on Some Pacific Coast Acteocinas (Nautilus xlii,1928,pp.37,38.)

1929- Description of Two New Species of Molluscs from the West Coast of North America (Nautilus xliii,1929,p.26).

Description of Two New Land Shells from Southern California (Bull. So. Calif. Acad. Sci. xxviii, part 2,1929,p.17).

1930- Least Bittern in California in Winter (Condor xxxiii,1930, p.64).

The Micrariontas of the indioensis Group, with the Description of a New Subspecies (Nautilus xliii, p. 115).

Notes on Micrarionta rixfordi (Bull. S. Calif. Acad. Sci. xxix,1930, p.15).

Desert Helicoids of the Micrarionta hutsoni Group (Nautilus xliv,1930, 1930, pp.4-6).

The Common Mynah Breeding in Los Angeles (Condor xxxii,1930,pp 301,302)

1931- The Condor in San Benito County, California (Condor xxxiii,1931,p.31).

Two New Helicoids from the Mohave Desert,California (Nautilus xliv,1931, pp. 123-125).

Third Ten Year Index to the Condor (P.C. Avifauna,No.20).

Three New Mollusks from Catalina Island,California. (Nautilus xlv, 1931, pp 65-67).

Psephis (Petricola) tellimyalis (Cpr.) Not the Young of Petricola denticulata Sby. (Bull. S. Calif. Acad. Sci. xxx,1931, p.39).

1932- A New Chiton from Southern California (Nautilus xlv,1932,p.101).

A New Helminthoglypta from Monterey County,Calif.(Nautilus xlv,1932, pp 134-136)

A New Cardita from the Aleutian Islands and a New Epitonium from Southern California (Trans. San Diego Soc. Nat. Hist. vii,1932,p185-90)

Sanderlings and Turnstones at Salton Sea,Calif.(Condor xxxiv,1932,p.228)

1933- A Revised List of the Birds of Southwestern California (Pac. Coast Avifauna, no.21,1933, 204 pp.)

1934- Two New Cingulas from Alaska (Nautilus xlvii,1934,p.103)

The Plain Titmouse of Northern Santa Barbara County,California (Condor xxxvi,1934, p.86).

Additional Fall and Winter Records for the Lutescent Warbler in California. (Condor xxxvi, 1934, p. 114).

The Lower California Say Phoebe in Southwestern California (Condor xxxvi, 1934, p.117).

(With Hildegarde Howard) Characters Differentiating Certain Species of Stercorarius (Condor xxxvi,1934,pp. 158-160)

Spring Notes from Mount Pinos, Kern County, California (Condor xxxvi, 1934, p.178).

A New Helminthoglypta from the East Slope of the Sierra Nevada,California (Bull. S. Calif. Acad. Sci. 33,1934,pp. 57-58).

1935- A New Kangaroo Rat from Northeastern California (Journ. Mam.16,1935, pp. 63-64)

Further Notes on the Desert Snails of Riverside County,California.(Descriptions of M. granitensis and M. mccoiana) (Bull. S. Calif. Acad. Sci. 34,1935,pp. 1-2).

Three New Micrariontas from the Central Colorado Desert,California (M. brunnea,chuckwallana,chocolata) (Nautilus,49,July,1935,pp 14-16).

Some SuperfluousNames in West American Chitons (Nautilus 49, Oct.1935 pp. 42-44)

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1937- Summer Tanger at Wilmington, Los Angeles County (Condor 39, Jan.1937, p.39).

Buccinum baeri morchianum (Fischer) not a Tenable Name (Nautilus, 50 p. 101).

Dipodomys deserti sonoriensis in Arizona (Journ. Mamm. 18,1937,p.101).

Micrariontas of the Southwestern Colorado Desert (Description of M. carrizoensis, M. remota) (Nautilus 50,1937, pp. 122-125).

A New Land Shell from the Riverside Mountains,Colorado Desert (Micrarionta immaculata) (Bull. S. Calif. Acad. Sci. 36,1937,pp. 6-7)

Ring-necked Duck in Ventura County,California (Condor 39,1937,p.125).

A New Callistochiton from Lower California (C. connellyi) (Nautilus 51, 1937, p.25).

Off-shore Bird Notes (Red-billed Tropic Bird collected) (Condor 39, 1937, p.226)

Additions to knowledge of the fossil invertebrate fauna of California (description of Triphora fossilis and Leptothyra subobsoleta) (Bull. So. Calif. Acad. Sci. 36,1937, pp. 61-64).

An Upper Pleistocene Fauna from the Baldwin Hills, Los Angeles County, California (Trans. San Diego Soc. Nat. Hist. 8, no.30, pp 379-406).

Report on Pleistocene Molluscan Fauna at Capistrano Beach,Orange Co., California (Bull. So. Calif. Acad. Sci. 36,1937, pp. 105-107).

1938- Another Saw-whet Owl from the San Bernardino Mountains,California (Condor 40,1938, p.87).

Remarks on some West American Mollusks (Nautilus 52, pp. 10-11)

Two New Land Shells from Kern County, California (H. stageri and H. cuyamacensis piutensis) (Bull. So. Calif. Acad. Sci. 37,1938,52-54).

A New Pseudochama from Clarion Island,Mexico (Pseudochama clarionensis) (Nautilus 52,1938, pp. 48-49).

Winter and Spring Gull Records from the West Coast of Mexico (Condor 40,1938, p.257).

1939- Another Specimen of Sooty Fox Sparrow from Southern California (Condor 41, 1939, pp. 33-34)

An Extension of the Known Range of Notiosorex crawfordi (Journ. Mamm. 20,1939,p. 102).

Control of Predatory Birds (Modern Game Breeding,9,Feb.1939,pp 12-13)

Remarks on Alaskan Savannah Sparrows (Condor 41, 1939, p.86).

Description of a New Mollusk from California. (Lamellaria sharoni) (Nautilus 52, 1939, pp 123-124)

Guadalupe Island Xantus Murrelet in California Waters (Condor 41,1939, p. 121).

Micrariontas of Desert Ranges Bordering the East Side of Coachella Valle and Salton Sink, California (Description of M. orcopia) (Bull. So. Calif. Acad. Sci. 38, 1939, pp. 14-16).

July Records from San Pedro, Calif. (Condor 41,1939,p.255).

A New Species of Mollusk from the San Pedro Pleistocene (Alabina effiae) (Bull, So. Calif. Acad. Sci. 38, 1939, p.202).

1940- A New Land Shell from Lower California (Micrarionta chacei) (Bull. So. Calif. Acad. Sci. 39, pp. 80-82).

A New Ischnochiton from Catalina Island,California. (Ischnochiton catalinae) (Bull. So. Calif. Acad. Sci. 39, pp. 185-186).

1941- Variation in North American Ravens (Auk 58, pp. 246-249).

Faunal Changes in Los Angeles County (Quarterly, L.A. Co. Museum, Oct.1941,19-23).

California Desert Land Snails (Min. Conch. Club So. Calif. Nov.1941)

1942- Common Birds of the Los Angeles County Coast (L.A. Co. Museum, Science Ser. 5, Zool. Publ. 1, Sept. 29,1942).

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1943- Common Birds of the Los Angeles County Mountains (L.A. Co. Museum, Science Ser. 6, Zool. Publ. 2, Jan. 15,1943).

Another Southern California Record for the Tennessee Warbler (Condor 45, 1943, p.74).

Review of " Joseph Grinnell's Philosophy of Nature" (Condor 45,pp.80-83).

(With H.S. Swarth) Ten Year Index to ' The Auk', published by the American Ornithologists Union,1943,pp. 1-374.

The Birds of the Urban Districts of Los Angeles County No.1 (L.A. Co. Museum, Sci. Ser. 7, Zool. Publ.3, Aug.1943).

Elephant Seal in Southeastern Alaska (Jour. Mammalogy 24,p 506, 1943).

Northwest American Species of Glycymeris (Bull. So. Calif. Acad. Sci. 42, pp. 107-114,1943 (Jan. 15, 1944).

1944- Two New West American Pelecypods (Cardita hilli; Chione picta) (Bull. So. Calif. Acad. Sci. 43, pp. 19-22).

Review of Herbert Brandt's " Alaska Bird Trails" (Condor 46,pp. 247-248)

Age of a Red-vented Bulbul (Auk. 61, pp 645-646,1944).

New Species of Mollusks from Redondo, California (Nuculana burchi, Volvulella tenuissima, Philine californica, Melanella rosa) (Bull. So. Calif. Acad. Sci. 43, pp. 71-73, 1944).

Mammals of Los Angeles County, California (L.A. Co. Mus. Sci. Ser. 9, Zool. no.4, Oct.,1944).

1945- The Type of Telespiza ultima Bryan (Auk. 62, p.139,1945).

The Acteocina of Salton Sink, Colorado Desert, California (Bull. So. Calif. Acad. Sci. 44 (1), pp. 28-29.)

Biography of Herbert N. McCoy (Condor 47, 1945, pp. 174-175).

Does the Russet-backed Thrush have Defective Eyesight (Condor,47,no.5)

Willett Types in the Los Angeles County Museum

Museum No.

1015- Acteocina culcitella intermedia
1016- Turbonilla cayucosensis
1017- Leptothyra engbergi
1018- Micrarionta ora
1019- Turbonilla strongi
1020- Pecten catalinensis
1022- Micrarionta indoensis cathedralis
1023- Micrarionta hutsoni unifasciata
1024-Micrarionta hutsoni hilli
1025- Mopalia pedroana
1028-Trophon albospinosus
1029- Micrarionta hutsoni amboiana
1030- Helminthoglypta reediana
1031- Helminthoglypta greggi
1034- Venericardia aleutica
1036- Epitonium pedroanum
1037- Cingula eyerdami
1038- Cingula forresterensis
1039- Helminthoglypta caruthersi
1040- Micrarionta chuckwallana
1041- Micrarionta chocolata
1042-Micrarionta brunnea
1043- Micranionta granitensis
1044- Micrarionta mccoiana
1046- Rochefortia reyana
1047- Bornia cooki
1048- Callistochiton connellyi
1049- Micrarionta harperi carrizoensis
1050 Micrarionta indioensis remota
1051- Micrarionta immaculata
1053- Triphora fossilis
1054- Leptothyra subobsoleta
1055- Helminthoglypta stageri
1056- Helminthoglypta cuyamacensis piutensis
1058- Pseudochama clarionensis
1059- Lamellaria sharoni
1060- Micrarionta orocopia
1061- Alabina effiae
1062- Micrarionta chacei
1063- Ischnochiton catalinae
1065- Glycymeris keenae
1066- Nuculana burchi
1067- Cardita hilli
1073- Volvulella tenuissima
1074- Philine californica
1075- Melanella rosa
1082- Acteocina anomala

Additions and Corrections

The following paper was received from Mr. Allyn G. Smith after the typing of pages 21-24. Comparison of Mr. Smith's diagnosis with the other is interesting.

Family Ovulidae vs. Amphiperatidae. In the Monterey paper we used the former but on further study I think the latter is to be preferred, following Schil-der, who, like Grant and Gale, says that " families and subfamilies should be named after the oldest name given to a genus which undoubtedly belongs to the family or subfamily". The genus in this case is apparently Amphiperas which is not represented on the West Coast. Schilder divides the family into two " Tribes", which seems all right but a rather unnecessary complication. Otherwise, like Strong, I would recommend following Schilder rather than Dall for this group. This leaves a consideration only of the genus Neosimnia Fischer,1884 for the West Coast species, with one exception- this being Cyphoma emarginata Sowerby,1830 from Mazatlan and south, which is out of our range.

Neosimnia loebbeckeana(Weinkauff)- Don't know this species and don't have the description, which, I surmise may be in Chemnitz Conch. Cab. The Academy does not have a copy of Chemnitz and the only one on the coast is at UCLA I am told. (* Note- also at U.S.C.- Editor *) If so, U.S. Grant would be the one to supply the description if it is in Chemnitz. Schilder (1932) refers to another paper by him in the Zool. Anzeiger in 1931 in which he comments on loebbeckeana and gives an outline figure of the type. As this is in German and I have no German dictionary handy, I am enclosing a copy of these comments along with a tracing of the figure he gives. This figure is strikingly like the shell I would identify as vidleri from Monterey and seems to be hardly as slender as barbarensis. I am skeptical of Schilder's placement of barbarensis and catalinensis as subspecies. Until it is dec-ided that loebbeckeana and barbarensis are the same or closely related, I prefer to consider the latter and catalinensis as separate species.

Neosimnia barbarensis (Dall)- Whether this is " the pellucid, pale, deep-water variety of loebbeckeana ", as Schilder thinks, depends on what the latter is and where it is normally found. As indicated above, I would rate barbarensis as a good species until better evidence is at hand. Although reported from Monterey by Keep and Berry, I am now inclined to suspect that these records are questionable and may refer to vidleri. Berry (1907) obtained a single specimen " over an inch long", which was identified as barbarensis but the size is nearer to vidleri. Barbarensis, as I understand this species, does not get much over half an inch long.

Collecting data: San Pedro Bay (Tremper),2; Off Newport, from fisher-men (Mrs. Baldridge) 2.

Neosimnia catalinensis Berry- - I don't agree with Schilder, that this is " evidently a young shell of barbarensis" Would call it a good species. The white color and thin lip appear to set it off from other species, and there are other differences.

Collecting data: Monterey (Dall), a record that needs confirming. Have seen no authentic specimens from the Bay. San Pedro Bay (Tremper), 1; off La Jolla, dredged by Univ. of Calif. 1
Both shells, above, which I identify as this species are much smaller than the type, but appear to be adult.

(con.)

Neosimnia vidleri (Sowerby)- Schilder (1932) says in a footnote to this species: " Future investigation will probably prove its identity with avena ." I doubt this/ Avena is a small transversely-striated species from the Mexican fauna, whereas vidleri is a large one with striae only showing at the extremities. The Academy has two lots: Monterey Bay, from fishermen (Hemphill), 2; Monterey Bay (Stearns Collection),1. These three shells agree in color markings although Hemphill's are larger, measuring 20.0 and 22.9 mm. in length. Color of the body whorl a rather light, washed-out pink with an indistinct band of white transversely across the middle and widening out somewhat at the outer lip and columella. The edges of this whitish band are indistinct and merge gradually into the pinkish color of the rest of the whorl. Lip and extremities are creamy-white, the latter having a suggestion of orange-yellow. If these shells have not faded with the years (as they may have), I suspect they represent a light-colored phase of vidleri. The one you collected, and those Vidler got originally could be a dark-colored phase. Does your shell show the indistinct whitish band encircling the body whorl ?

Neosimnia inflexa (Sowerby)- Schilder puts " variabilis Reeve 1865" in synonymy, but this is an error for variabilis C.B. Adams 1852 (Panama Shells) Tryon, in the Manual, calls variabilis C.B. Adams a " variety" of O. uniplicata, an Eastern U.S. and West Indian species, and then follows the inadmissible procedure of placing several older species in the synonymy of variabilis, including inflexa Sowerby,1832, rufa Sowerby,1832, loebbeckeana Weink. 1881, livida Reeve 1865, californica Reeve 1865, and aequalis Sowerby Sowerby 1832. This is such a conglomerate mixture that it doesn't make sense with what we know now, so I think we can disregard Tryon entirely. The original description of inflexa is as follows: * This is already copied and on p. 23)*

The description of variabilis is in Oldroyd, but as Adams' remarks are of considerable additional interest I am enclosing a pencilled copy of them. Note that he says his species " resembles inflexa" and says that on comparison the two may prove to be identical. Note also that both the light and the purple color-phases were collected on the same species of cream-colored gorgonian, which throws doubt on Tryon's statement that shells of this group take on the color of the gorgonian on which the animal feeds. * See end of this paper for these notes from Adams etc. *

I think we can safely put variabilis into the synonymy of inflexa, and call our California shells with the carinate columella and the purple color this species. The only other species with a columellar shelf if N. aequalis Sby.

Collecting data: Monterey Bay, a young living specimen dredged in 12 fms. (Berry); Monterey, from fishermen or on the beach, 8 (AGS collection although collected by others); Monterey, from a cod stomach (Gordon) 2; Gulf of Calif., Hemphill, 10 (CAS); Gulf of Calif., Hemphill 2 (CAS).

Neosimnia aequalis (Sowerby)- As Schilder says this species is found in California we will have to consider it. He puts californica Reeve 1865 in synonymy, and reports the range as California, Lower California, Mazatlan, Mexico, Galapagos Islands, and probably also Ecuador. The description of californica follows, from Reeve:

" Shell elongately oblong, livid purple, or lead color, back smooth, lip moderately thickened, flexuous, extremities somewhat acuminately produced, aperture wide open, columella slightly excavated, obtusely callously plaited at the upper part." ..." Sowerby, MS, in Mus. Cuming." ... " Hab. California .. of a peculiar livid, leaden-purple color; the callous enamel of the lip and columella being of an orange blood-red." (con.)

Collecting data: San Lucas Bay, L.C. 1 (CAS); Mazatlan, coll. by Hertlein, 2 (CAS).

These specimens are not very different from those of the preceding species (inflexa) and appear to be well within its range of variation. Schilder's figure figure emphasizes a longitudinal plication or callous plait at the upper part of the shell, which seems to be the major difference between aequalis and inflexa. On the strength of the small amount of evidence I have, there would seem to be some justification for throwing aequalis into the synonymy of inflexa, but you may find other evidence to let it stand as a good species.

Neosimnia avena (Sowerby)- This is a Lower Californian and Mexican red-purple species, characterized by having the body whorl crossed by numerous fine rather wavy striations. It is distinct and there is no other close to it. Sowerby's description follows:
" Ovulum avena Sowerby, P.Z.S.,1832, p. 173. " Ov. testa oblonga, rufa, extremitatibus subacuminatis; dorso subgibboso, transversim tenuissime striato; labio externo incrassato, pallidiore; apertura angusta, antice latiore, postice emarginata; columella postice uniplicata: longo 0.55, lat. 0.22 poll." ... " Hab. in America Centrali (Conchagua)".
Tryon puts vidleri in synonymy, which is definitely wrong. He also states the range as " Panama to Monterey", but I have seen no specimens from Monterey and very much doubt its occurance in California, in spite of the fact that Adams (Panama Shells) says " Santa Barbara- E. Jewett/ Gould MSS." Adams says he found 6 specimens " on the reef at Panama". He says also that " Conchagua" is another name for the Gulf of Fonseca.

Collecting data: Mazatlan, on the beach, coll. by Hertlein, 3 (CAS).

Neosimnia rufa(Sowerby)- Livida Reeve in synonymy, according to Schilder, whose measurements show that rufa is the smallest of the West Coast species averaging 5-7 mm. in length. The Academy has a lot of 2 specimens collected by the Albatross in Lower California at San Lucas Bay. Schilder cites the range the same as for aequalis , which includes California. Would omit it from our list unless authentic records from California are reported. It is a tiny, brilliant species. You would know it if you have one.

Neosimnia quaylei Lowe- Not on our list, but mention it because I suspect it may be found elsewhere than Punta Penasco with more collecting.

I am enclosing also some pencilled outline tracings of several species illustrated by Schilder and Reeve's figure of californica, as you may find them helpful.

C.B. Adams- Panama Shells 1852- pages 31-32- 4. Ovula variabilis- Nov. sp.
" Shell very slender usually white, with a slight tinge of rufous, with the lip opaque white; sometimes of a rich red purple; smooth; aperture not very narrow, a little widened anteriorly, moderately produced offuse, and slightly inflected posteriorly; obliquely emarginate anteriorly; lip well thickened; columella with a longitudinal keel, acute and obliquely produced anteriorly, posteriorly somewhat biplicate. Length .54 inch; breadth . 15 inches.

" This shell resembles O. inflexa Sowerby, but is more slender. Perhaps on comparison specimens, they may prove to be identical. O. uniplicata Sowerby is larger, with a wider aperture.

" Station- At the low water mark of the spring tides. The light colored specimens were found on a cream-colored species of Gorgonia, and the purple specimens on Gorgonia of the same color. Of 56 specimens, four are purple, and 14 are mature, and 42 immature. (con.)

" Habitat.- San Juan, Lower Calif.- Lt. Green/ Gould MSS. Purple shells. Santa Barbara- E. Jewett/ Gould MSS. Pale or moderately tinged with purple. Panama- CBA.
The 56 specimens were all taken on the reef at Panama. Mr. Cuming found one specimen of O. inflexum in the Gulf of Dulco."

5. Ovula sp. Indet.

" We abstein from describing this species, because the only two specimens which we have are immature. They resemble O. variabilis but the general form and the aperture are wider, and the shells are covered with excessively minute revolving striae. Except in being striated, they resemble O. inflecum Sowerby. They were found on the reef."

The original description of this species follows. The data given on p.23 we note was Weinkauff's.

Ovulum inflexum Sowerby- P.Z.S., 1832, p. 173.

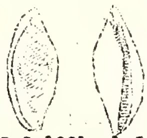
" Ov. testa oblonga subcylindrica, laevi, pallida, postice subrostrata, inflexa; apertura antice subeffusa; labio externo incrassato, collumellari intus carinato; columella postice uniplicata: Long. 0.70, lat. 0.25 poll."
" Hab. in America Centrali. (Gulf of Dulco)."

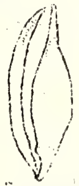
Schilder, F.A. Zool. Anz. Vol. 96, No. 3,4, pp. 65-72, figures 1-7, Sept. 15,1931.

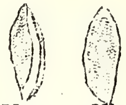
I. Wissenshaffliche Mitteilungen- Beitrage zur Kenntnis der Cypraeacea (Moll. Gastr.) - IV.

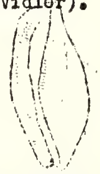
12. Weinkauffs Typon in Loebbecke -Museum.

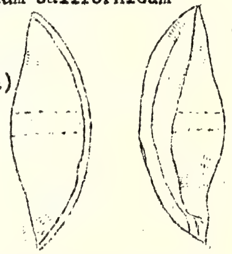
p.67-" Ovula loebbeckeana: Da wie von weinkauff gegebene Zeichnung (Taf. 50, Fig. 6-7) in allen Teilen vollkammen missroten ist,sei hier einegenouere Abbildung des Originals wieder gegeben (Abb. 1). Der typus misst 23.4:34/26. R. ohne Querkiel, E. fein gestreift, otusas linksgegoben, Al.schmal,vorn kaum ausgebogen (/). Funiculum schrag, massig stark,die IL. nur wenig uber die Halfte uberguerend (/), hintere IL.- Spitze deutlich obgesetzt ausgesgen, Fossula auf einen ganz leichten, kurtzen Langseindruck reduziert; R. lilarosa (Weinkauffs Beschveibung: "albo";Abbildung: lila). Die Artmerkmale stimmen vollkommen mit der allerdings noch dunnschaligeren,blassgelben Neosimnia barbarensis (Dall,1892) aus Kalifornien uberein; diese ist also als Unterart (Tiefwasser form) mit loebbeckeana zu verinigen."


Sowerby P.Z.S,1881,pl.56
Fig. 1 Ovulum vidleri, n. sp.
" Hab. Monterey, west coast of America (Mr. Vidler).


N. loebbeckeana barbarensis
(17 mm. California)
Schilder,1932
pl.5, fig.53


50a 50b
Reeve,1865,15
Ovulum californicum


Neosimnia avena
(13 mm. Mazatlan)
Schilder,1932, pl.4, fig.50


Neosimnia loebbeckeana Weink.
(Typus)

Several of the members contributed to the discussion brought up again in Minutes # 52 p 34 by A.W.B. Powell.

Dr. A. Myra Keen writes " As to Mr. Powell's comment on page 34 of last month's Minutes: Opinion 124 covers the case of Bulla: " The various subdivisions of genera published by Linnaeus in 1758 are not to be accepted as of this date (1758) as of subgeneric value under the International Rules". This decision was rendered as a general opinion and as a specific answer to the problem of Linnaeus' double usage of the name Bulla.

Mr. Henry Dodge, 6 Rochambeau Road, Scarsdale, N.Y. writes in as follows: " My congratulations to you upon the continued excellence of the Check List of California mollusks, and the interesting comments thereon, in the Minutes. I have been particularly interested in the Bulla dispute. New views keep coming in all the time on this question and I should think that a lot of it could be simplified if you would broadcast the fact that the International Commission has laid to rest the complication brought about by the famous " cricket" argument (Subgenus Bulla, under Gryllus, Insecta, Coleoptera, pg. 427, Syst. Nat. Ed. 10.)

A.W.B. Powell has raised this ghost again in the September Minutes. A reading of Opinion 124 of the Commission, and their added comments should clear the air on this point at least. ... I am adding the Opinion and the comments on the attached sheet.

Opinion 124 of the International Commission- Issued October 28th,1936.
124. Linnaeus,1758, Subdivisions of Genera.- The various subdivisions of genera published by Linnaeus in 1758 are not to be accepted as of this date (1758) as of subgeneric value under the International Rules.

The Commission adds:

" The adoption of this automatically settles the case of Bulla now before the Commission, i.e. the alleged subgenus Bulla Lin. 1758 , Insect, is not a subgenus under this opinion and therefore does not affect in any way the standing of Bulla Lin. 1758 (a), Mollusk.

" Even in the absence of this opinion, the case of Bulla would be settled under the following amendment to Article 30 (on Homonyms) adopted at Padua 1930: (Note: This is apparently a misprint for Art.36).
" When homonyms are of the same date, whether by the same or different authors, then any name proposed for a genus takes precedence over a name (its homonym) proposed for a subgenus. The same principle applies to homonyms of species and subspecies of identical date."

(This latter amendment was mentioned by C.W. Johnson in the Introduction to his " List of Marine Mollusca of the Atlantic Coast...." 1934, and specifically applied by him to the Bulla question. Grant and Gale, on the other hand, reject Bulla, Mollusk, as a homonym (see their discussion of Scaphander, pg. 451, and Bullus, pg. 455-6) although the amendment was published a year before Grant and Gale catalogue appeared.)."

Our conclusion and discussion of the above matter was contained in Minutes #47 , pp. 20,21. We decided that the name Bulla should apply to the group formerly known as Atys. In Minutes #48 pp 2-3 we place the species formerly placed under Bulla under Vesica. Otherwise we have followed other recent authors in accepting Bulla according to the above data. Editor.

Additions and Corrections

The following additional comments and data on the Neosimnia discussion received from Mr. Allyn G. Smith. " Hertlein has just sent me the descriptions from Sowerby of the Lower and Central American species, and, as I did not include all of them in my last letter, I will enclose them. This shows that N. inflexa has page perference and the name would stand in the event that aequalis is finally decided to be the same.

P.Z.S. 1832 p. 173

Ovulum rufum- testa oblonga, postice acuminata, rufa; labio externo incrassato, pallidiore; apertura angusta, antice latiore; columella intus linea longitudinali depressa, plicaque subspirali; long. 0.50, lat. 0.15 poll. Hab. ad Columbiam Occidentalem.

Ovulum avena- See page 39 this issue Min. for Orig. description.

Ovulum inflexum- See page 40 "

p. 174 P.Z.S. 1832

Ovulum aequale- Testa oblonga, subcylindrica, rufa; labio externo incrassato; extremitatibus obtusiusculis; apertura latiuscula, utraque extremitate aequali; columella carina interna distincta; long. 0.45, lat. 0.18 poll. Hab. as panamam.

Add the following collecting data:

Pedicularia californica Newcomb, 1864- 53:25- Monterey Bay, 20-50 fathoms, on pink coral, generally brought in by fishermen. Monterey Bay, " one beautiful specimen is over half an inch in diameter" (Berry, 1907).

Zonaria spadicea (Swainson), 1823- 53:25-" Cypraea spadicea Swainson- Living at low tide, a single specimen, Monterey Bay (Mrs. Fackenthall). I have seen this specimen and consider the record to be authentic. See Ingram, Nautilus, 52(1): 1-4 and plate. Hertlein and I would prefer to retain Cypraea. Ingram should be consulted on the taxonomy of the group as he has made a recent study of it." Mr. W.K. Emerson also contributes a note on this species " Common at the end of Point Loma. They were found for the first time in several years in Mission Bay last year. I am afraid the collectors have almost cleaned the colony out."

Pusula solandri (Sowerby), 1832. 53:27- San Clemente, Vail (AGS); 5 mi. S. of Laguna Beach (AGS); Magdalena Bay, Orcutt (AGS).

W.K. Emerson reports " Beach specimens at Coronado, Calif.; common at Loreto, Baja Calif." R.L. Morrisson " La Jolla, Torrey Pines". All reported as Trivia.

Pusula radians (Lamarck) and Pusula sanguinea (Sowerby)- 53:27- Mr. Smith advises " CAS specimens are all from the Gulf. Have seen none from California."

Pusula [illegible] Raymond - 53:27 - Monterey (Dall); 33 fms. off Isthmus, Catalina, T. Crocker, 1938, 1 small specimen (Gordon).

Pusula californiana (Gray)- Monterey Bay, below low tide to 40 fms. Living at low tide on rocks at Mission Bay (AGS); Pleistocene at Cayucos (AGS). W.K. Emerson " Beach specimens at Coronado". R.L. Morrison " Mission Beach".

Erato vitellina Hinds- 53:30- Monterey Bay, shore to 35 fms. (A.G. Smith) Rare alive in Mission Bay (W.K. Emerson);

Erato columbella Menke- 53:31- Monterey Bay, shore to 20 fms. (A.G. Smith). Common in sand at La Jolla (W.K. Emerson). Mission Beach, Mission Bay, La Jolla, Pacific Beach (R.L. Morrisson).

We regret to again report the death of another of our leading west coast paleontologists. Professor Bruce L. Clark of the Museum of Paleontology, Berkeley, Calif. died September 23. And Dr. F.M. Anderson, another veteran paleontologist passed away the same week.

Dr. T. Van Hyning, The Florida State Museum, Gainesville, Florida- Dr. Van Hyning recently wrote that he has one of but two of the original first issue of the Nautilus . This was printed on a postal card and was more or less an announcement of the " Conchologist's Exchange" later taken over by the Nautilus. It was printed in July, 1886 and was stated to have been sent to 500 conchologists. Anyway I had no idea it was so rare and wonder if the several reputed copies on this coast are all reprints. I know that Dr. Fred Baker of San Diego had what he thought to be an original. This is no doubt now in the library of the San Diego Museum. I completed my file of the Nautilus and Conchologists Exchange by making photostats of this card. There are quite a lot of complete files of the Nautilus in the hands of our members.

Mr. Henry Dodge, 6 Rochambeau Road, Scarsdale, N.Y. " I am still hoping to come to California some winter very soon with the idea that it may be possible to arrange my affairs so that we can live there. "

Mrs. Warren Fiske, 8 West Vernon Place, Boston, Mass. wants information where she can obtain about three dozen specimens of Pecten hericius of various sizes and deep color. Also, she wants to get in touch with someone who can furnish her with " snow white Florida fossils."

W.P. Cook, 2966 Union Ave., San Diego 1, Calif. We are glad Mr. Cook is getting stronger after his recent illness. The editor is enjoying another box of his delicious Avocados now. Mr. Cook reports that Andy Sorensen wrote him that our report of his having 60 species of Haliotis in his collection was an error- he has but 42. Well we thought 42 species of Haliotis is a lot. The report is though that Mrs. Hattie Gemmell, 1305 Magnolia Ave., San Jose, Calif. has tops in Haliotis with 49 species. Mr. Cook has 158 species of Cypraea. I know of no private collection that has that topped.

Lieutenant V.D.P. Spicer, Rt. 2, Box 237, Centralia, Washington. We are advised that this is the present address. Lieutenant Spicer has been on duty at the University of California at Berkeley.

Dr. W.P. Woodring, U.S. Geological Survey, Washington 25, D.C. Dr. Woodring advises us to change the address for his copy of the Minutes to the above address. He has been doing some special work at U.C.L.A. He adds " I am leaving Los Angeles Oct. 1. I had been hoping to attend one of the monthly meetings of the Club, but I was in the field on meeting days or something else interfered. "

Ernest N. Wilcox, 1738 Johnson Ave., San Luis Obispo, Calif. " ... It is fine to be able to get gas again to go places. My friend Capt. Hecker of the Fish and Game Patrol had to give up the headquarters he has had on San Farpojo Creek for several years, as Hearst has sold that property. I was quite sorry as it is a good collecting place, both along the creek and the near by ocean.

Mrs. Aurora Trethewey, 1129 Alberta Place, San Diego 3, Calif. " Your notes on Mytilus edulis diegensis Coe are particularly interesting. Have found quite a number of these alive in Mission Bay this past year."

W.J. Eyerdam, 7531 19th Ave., N.E., Seattle 5, Wash. Mr. Eyerdam has been at Port Vita, Alaska for the summer but writes that he expects to return shortly to his home in Seattle. " During the summer I have made a fine large collection of plants for my herbarium and plenty of specimens for sale or exchange. I have collected about 90 species of marine shells, most of which are small and many are only single specimens. There are only two or three species that I did not recognize. Next winter I will send you a list for the Minutes."

M.K. Jacobson, 455 Beach 139 St., Rockaway, N.Y. Mr. Jacobson spent the summer vacation months at Peekskill, N.Y. and reports on collecting there. " Peekskill collecting was moderately interesting, the best find being a whole colony of undersized but quite good looking Triodopsis albolabris Say, which were inhabiting an exposure of shaley rock thru which U S 9 had been cut between Annsville and Canopus Creeks right outside of Peekskill. The snails were clinging everywhere and were a real pleasure to collect after all the raking thru old leaves that was necessary to collect them in other less favorable places. It is strange though that the snails found under leaf mould in the woods on granitic soil are so much larger than these shale dwellers. The colony should thrive, for there must have been 20 immature forms (whicj of course I did not molest) for every adult taken. On the hillside nearby were many dead and bleached shells, some of which served as the dwelling place for smaller forms. I found 2 Cochlicopa lubrica Mull. 2 Vallonia pulchella Mull., and one Retinella electrina Gld., all alive, in a few shells that I broke open. The strangest part of the whole affair was the fact that I passed the spot many times and did not notice a single shell, though I am usually quite sharp sighted. I just had not gotten into the habit of seeing snails in such locations. It took my nephew, Walter Smit, a newcomer to collecting, to discern them. You see, he had not gotten into fixed ideas about where to look. He tried everywhere. I wonder what kind of lesson there is in this for us."

Mr. Carl W. Erickson, 4 Windsor Ave., Auburn, Mass. " We organized a shell club here late last spring with 15 charter and enthusiastic members. It has been named the Clench Conchological Club of Worcester in recognition of the work Dr. Clench has done and is doing in the field of mollusca. He also has done much to give us our start, donating to the club a substantial collection of shells originally intended for Germany.

Mr. Anthony D'Attilio, 102 Hilltop Acres, Yonkers, N.Y. Mr. D'Attilio recetly wrote an account of the importing and sale of the John Calvert collection. That this must have been an amazing collection there is no doubt. It is interesting to note that even this writer, the editor, has received sets from several different persons labelled as coming from the Calvert collection. It was brought over from England by a dealer, Mr. Martin Ehrman and sold to the public. Mr. D'Attilio comments about it " Well if you have ever had anyone take you through a museumand said to go ahead and take what you like, you might picture what that collection resembled. I might say to make it short that besides many fine cabinets filled to the brim, there were 300 large cases about 3 feet by 3' by 3'. "

Mr. Charles P. Williams, 92-11 35th Ave., Jackson Hts., Long Island, N.Y. Mr. Williams recently wrote us asking if we planned to again resume the sale of shells. The answer is no, but perhaps there are those among the members who have nice material for sale.

Mr. and Mrs. George W. Austin, 1049 Georgia St., Los Angeles 15, Calif. " Its nice to travel in circles-- here we are right back where we started from. Weare not in Tujunga now. " " ... hope to be able to join you once more."

Mrs. Agnes J. Shumate, P.O. Box 474, Ocean Park, Calif. This is the new address having moved from 3680 Colonial Ave., Venice, Calif.

Mr. H.J. Koch, P.O. Dynamite Factory, Somerset West, South Africa. " ..In regard to shells themselves we do not get many by dredging as such operations are not carried on extensively on these coasts. Of the shells obtainable on the shore many are worn but it is possible to obtain quantities of the Turbinidae, Haliotidae, Patellidae and others which are available in shallow water. If you are interested in these, exchange could be arranged and in some cases it would be necessary for you to purchase as some of the folk who would collect are relatively poor and they need the money.

At present I would like some named American Patella .. If you are inter-

(con.)

-ested to maintain contact I may be able to assist you. I cannot offer much of my time to exchange work however, unless it is of value to my investigations."

More New Publications Received-

Revista De La Sociedad Malacologica " Carlos De La Torre", Vol. 3, No.2, September,1945.

Those interested in receiving this splendid periodical should write Apartado 2634, Habana, Cuba.

The editor has been refreshing his Spanish and enjoying this issue of our brother conchologists in Cuba. The papers are well prepared and beautifully illustrated. Some of the articles follow:

" El Genero Farcimoides En Cuba" by Oscar Alcalde Ledon. 2 plates, many figur

" Estudio y Revision De Los Moluscos Cubanos Del Genero Farcimen" by Oscar Alcalde Ledon. This paper contains not only carefully prepared descriptions but keys for the differentiation of subspecies that should be invaluable to a student of the genus.

" Excursion Malacologica Al Pan De Guajaibon" by Miguel L. Jaume.

The department " Notas y Variedades" by C.G. Aguayo discusses recent changes in nomenclature with references to our Minutes. The writer here calls attention to another matter in connection with our recent Nassa etc. discussions. Julia Gardner in " The Molluscan Fauna of the Alum Bluff Group of Florida" Pt. VII,1944 proposed that we employ the name Uzita H. & A. Adams,1853 in place of Alectrion,Nassa or Nassarius for the species of the group, ambigua, hotessieri, and consensa.

" Shell Notes" by Frank Lyman, Lantana, Florida. Frank's little magazine improves with each issue. He has three plates in this one. If you are not already on his mailing list you are missing something.

The Bulletin of the Natural History Museum of San Diego for October,1945 has been received. A number of new publications are announced but none of them pertaining to conchology. The museum has been in use as a hospital by the Navy. There is some speculation about when the exhibition halls of the museum will again be open to the public. But that may still be some time away. Afterall, even if the shooting has ceased, the wounded are not healed.

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Mrs. Lottie Sweebe, The Play House, Airport Road, Mt. Pleasant, Mich . is interested in purchasing shells.

Arthur P. Hahnel, Royersford, Penna. is also interested in purchasing individual specimens and collections.

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ANNOUNCEMENT

It was voted at the October meeting to resume our pre war time of meeting.

We will hereafter meet on the first tuesday evening of each month at 7:30 P.M.

The next meeting will be held on Tuesday, Nov.6, but it was voted to attend the lecture on the Great Barrier Reef at the Hancock Foundation, University of Southern California. Members will meet there.

Architectonicidae
Modulidae
Bursidae
Strombidae
Cymatiidae
Seguenziidae

Triphoridae
Cerithiopsidae
Cerithiidae
Trichotropidae
Caecidae
Vermetidae
Turritellidae

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
November 1945

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, non-members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or $1.25 each six months.

Our next meeting will be held Dec. 4,1945, at the Los Angeles Museum, Exposition Park, Los Angeles, Calif. at 7:30 P.M. All interested persons are welcome.
We are again meeting on the first tuesday of each month at 7.30 P.M.

Please maill all news about shells, shell publications, shell collectors shell trips, localities etc. to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.
Phone Ax 2-7965

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The following families are not represented in the California fauna, but the key and list of species from the southern fauna are copied from Mr. A.M. Strong's notebook.

Family Architectonicidae

Genus Haliacus

Spire with a subsutral periphery with 2 spiral cords, base grooved
Diameter 4.3 mm. Mazatlan .... planispira
Spire with 3, periphery with 2, base with 5 spiral cords
Diameter 4.5 mm. Acapulco .... chiquita
Spire with 4 or more spiral cords
. Base smooth, umbilical margin crenulated
Diameter 6 mm. Chile .... kochii
. Periphery with two cords, base with 5 granular grooves
Diameter 5.8 mm. Mazatlan .... mazatlanicus
. Periphery and base with 6 spiral cords
Diameter 15 mm. Magdalena Bay to Panama .... radiatus
. Peripheryand base with 8 spiral cords
Diameter 3.8 mm. Panama .... panamensis

Haliacus radiatus Menke Magdalena Bay to Panama
Haliacus mazatlanicus Pilsbry and Lowe, 1932 Mazatlan
Haliacus planispira Pilsbry and Lowe, 1932 Mazatlan
Haliacus chiquita Pilsbrya nd Lowe,1932 Acapulco
Haliacus panamensis Bartsch,1918 Panama
Haliacus kochii Dall,1909 Chile

Genus Architectonica Roeding,1798

Architectonica granulata (Lamarck),1822 Lower Calif. to Peru (nobilis Hinds
Architectonica granosa Val. (,) Acapulco
Architectonica (Philippia) radialis Dall,1908 Panama

Family Modulidae

Genus Modulus

Columella grooved, ending in a sharp tooth .... Modulus
• Axial sculpture absent, periphery sharply keeled
•• Spire and base with subgranular spiral cords
Diam. 18 mm. Magdalena Bay to Peru .... catenulatus
• With distant radial ribs forming nodules at the periphery
•• Spire depressed, base with 1 or 2 major spiral cords
Diam. 12 mm. Lower Calif. to Panama .... cerodes
•• Spire conical, base with close spiral cords
Diameter 10 mm. Magdalena Bay to Panama .... disculus

Modulus catenulatus (Philippi),1847	Magdalena Bay to Peru- Atlantic
Modulus cerodes A. Adams,1852	Lower Calif. to Panama
Modulus disculus (Philippi),1847	Magdalena Bay to Panama
Modulus perlatus Dillwyn,1817	Ecuador to Peru
Modulus duplicatus (A. Adams),1850	Galapagos

Genus Haploconchlias

Haploconchlias cyclophoreus Carpenter	Gulf of California

Family Planaxidae

Genus Planaxis

Planaxis nigritella Forbes,1850	Lower Calif. to Panama
Planaxis planicostatus Sowerby,1825	Gulf of Calif. to Peru

Family BURSIDAE

Grant and Gale state " The Bursidae", formerly called the Ranellidae, differ from the Muricidae in radular characters and in the less often closed anterior canal, and from the Cymatiidae in having a well developed posterior canal."

Genus Bursa Roeding, 1798. Type (by subsequent designation, Jousseaume, 1881), Bursa monitata Roeding = Murex bufonius Gmelin.

" Shell ovate, rather compact, with two continuous opposite varices or protruding nodosities; aperture ovate, with a well-marked posterior canal and an open, curved anterior canal; columella arcuated or ridged."

Bursa californica Hinds, 1843. Monterey, Calif. to Cerros Island, L.C. and Guaymas, Mex. (Lowe). Type locality, San Diego, Calif.

Collecting data: Dredged off Monterey in 10 to 20 fathoms on the shale—was comparatively rare netting but five living specimens ; very abundant off Redondo Beach and Catalina Island in 15 to 50 fms. most common around 25 fms. washed in after storms all along the southern California coast; it is obviously a scavenger and gets into crab and lobster traps in great numbers. It is very abundant along the coast of Lower Calif. below Ensenada. Some eat them and they are sold for food on the Redondo Beach pier.(Burch); Cayucos living and fossil (Caruthers); Guaymas, Mex. (Lowe); Santo Domindo, L.C. (Orcutt); San Bartolome Bay, L.C. (Harrison); San Diego (Baker and Orcutt); Mission Bay (Wilson); Del Mar (Bristol); Catalina Island in 30 fms. (Lowe).

The following key and list of species from the southern fauna will be of interest. It is from Mr. A.M. Strong's notebook.

A single row of strong nodules on the shoulder
- Surface above and below the shoulder smooth
  Height 40 mm. Lower Calif. to Panama .... nana
  Reeve, Ranella, pl. 68, fig. 29; Tryon, vol. 3, p. 38.
- Surface smooth between spiral lines of granules
  Gulf of Calif. to .... albifasciata
  Reeve pl. 6, fig. 27
- Surface spirally striated, slightly granular
  Height 125 mm Monterey to Cerros Island .... californica
  Reeve pl. 2, fig. 9; Oldroyd 2-2-241.

Two unequal spiral series of nodules, fine beaded threads
Height 45 mm Lower Calif. to Panama .... calcipicta
Bull. Mus. Comp. Zool. 43-320

Several spiral series of double nodules, surface striated
columella with white granular wrinkles
Height 40 mm Gulf of Calif. to Peru .... caelata
Reeve pl. 3, fig. 10; Tryon vol. 3, p. 41

Surface obscurely rugose or smooth
Height 75 mm. Peru .... ventricosa
Reeve pl. 2, fig. 6; Tryon vol. 3, p. 40.

Bursa californica Hinds, 1843. Monterey to Guaymas
Bursa nana (Broderip and Sowerby), 1829. Lower Calif. to Panama
Bursa albifasciata (Sowerby), 1841. Gulf of Calif. to
Bursa caelata (Broderip), 1832 Gulf of Calif. to Peru
Bursa calcipicta Dall, 1908. Lower Calif. to Panama
Bursa (Crossata) ventricosa (Broderip), 1832. Nicaragua to Chile

The following genera are not represented north of San Diego, but the data from Mr. A.M. Strong's notebook will be of value.

Family Strombidae

Genus Strombus Linnaeus,1758.

Strombus gracilior Sowerby,1825.	Lower Calif. to Ecuador
Strombus granulatus Swainson,1823.	Gulf of Calif. to Peru
Strombus galeatus Swainson,1823.	Gulf of Calif. to Panama
Strombus peruvianus Swainson,1823	Tres Marias Islands to Peru

Shoulder of whorls tuberculate
. Body whorl smooth
Length 3 inches Lower Calif. to Ecuador .... gracilior
. Body whorl with spiral rows of nodes
.. Spire turrited, strongly tuberculate
Length 3.5 inches. Gulf of Calif. to Peru .... granulatus
.. Spire depressed, spirally ribbed
5 to 7 inches. Tres Marias Islands to Peru .... peruvianus
Shoulder of whorls not tuberculate
Length 8.5 inches. Gulf of Calif. to Panama .... galeatus

Shell subtriangular to cylindrical
. Body callus conspicuous .... Cassis
.. Callus margin adherent ....(Cypraecassis)
... With 4 spiral rows of tubercles and paired spiral grooves
Height 125 mm. Gulf of Calif. to Galapagos .... tenuis
Reeve- Cassis, fig.13; Tryon vol.7,p.272
.. Callus margin free near the canal ....(Levenia)
... With 3 to 4 spiral rows of tubercles and granular spiral ridges
Height 85 mm. Gulf of Calif. to Panama .... coarctata
Reeve, Cassis, fig.14; Tryon, vol.7, p. 272.
. Body callus inconspicuous .... Morum
.. With 5 spiral rows of tubercles and fine spiral ridges
Height 35 mm, Gulf of Calif. to Panama .... tuberculosa
Reeve, Oniscia fig.5; Tryon,vol.7, p.281.
Shell globose or globosely ovate
. Columella plaited or granular .... Phalium
.. Lip thickened, slightly effuse toward the base
Height 125 mm. Gulf of Calif. to Ecuador .... abbreviata
Reeve, Cassis,fig.18; Tryon,vol.7,p.274.
.. Lip with 4 spines toward the base
Gulf of Calif., South Seas .... vibex
Stearns, Proc. U .S.N.M. vol. 17, p. 188
. Columella simple ....Oocorys
.. With close spiral cords and fine axial threads
... Axial threads overrunning the spirals
Height 30 mm. Panama, 1201 fms. .... pacifica
Bull. Mus. Comp. Zool. v.43, p. 323, pl.4,fig.7
... Axial threads in interspaces only
Height 45 mm. Panama, 1672 fms. .... rotunda
Bull. Mus. Comp. Zool. vol.43, p.322, pl.4, fig.9
.. With flat spiral bands and fine axial lines
Height 60 mm. Galapagos, 2235 fms. .... elevata
Bull. Mus. Comp. Zool. vol.43,p. 322, pl.8, fig.9

Genus Cassidea	
Cassidea abbreviata (Lamarck),1822.	Gulf of Calif. to Ecuador
Cassidea vibex mexicana Stearns	Lower Calif.
Genus Cypraecassis	
Cypraecassis tenuis Gray (Wood),1828	Gulf of Calif. to Galapagos
Cypraecassis coarctata (Sowerby),1825	Gulf of Calif. to Panama
Genus Morum	
Morum (Plesionisca) tuberculosum (Sowerby)	Lower Calif. to Panama
Genus Oocorys Fischer,1884	
Oocorys rotunda Dall,1908.	Panama
Oocorys pacifica Dall,1896	Panama
Oocorys elevata Dall,1908.	Galapagos
Family Ficidae	
Genus Ficus Roeding,1798	
Ficus ventricosus (Sowerby),1825.	Gulf of Calif. to Panama
Family Tonnidae	
Genus Malea Valenciennes,1832	
Malea ringens (Swainson),1822.	Gulf of Calif. to Peru

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Family Cymatiidae

Genus Fusitriton Cossmann,1903. Type (by original designation), Triton cancellatus Lamarck.

" Shell thin, cancellated, no body callus, varices few and feeble, epidermis shaggy and usually persistent."

The above data from Dr. A. Myra Keen (Per. Comm. Sept.,1945).

The most important reference on this matter is Woodring, W.P., Geological Survey Professional Paper 190,pp. 23-24,1938. Dr. Woodring advises " Triton" oregonense is closely related to " Triton" cancellatum Lamarck (Cape Horn and vicinity), the type of Fusitriton, and I think Fusitriton should be given generic rank. Argobuccinum and Priene are quite different."

Dr. A. Myra Keen advises further (Per. Comm. Sept. 1945) as follows: " Genus Argobuccinum Herrmannsen,1846 (ex Klein). Type (orig. desig., Murex argus Linne. This is a heavy, dull-colored shell with inconspicuous varices and a short canal. It is not the Argobuccinum of subsequent authors, for which Fusitriton is available. Priene Adams,1858 resembles Fusitriton but also like Argobuccinum has a short canal; the operculum has an apical nuclear and there is a slight more or less lirate body callus".

West coast authors have been disposed to use a variety of names for this species. A synonymy would amount to a list of all recent authors. We propose to accept the above classification.

Fusitriton oregonensis (Redfield),1848. From the line of floating ice in winter in the Bering Sea near the Pribilof Islands, south on the west to the Okhotsk Sea and Japan, and on the east to San Nicolas Island, Calif.; San Diego in deeper water. (Raymond).

" The type locality of Fusitriton oregonense is Straits of Juan de Fuca" (advice of Dr. A.M. Keen).

Collecting data: San Diego, deep water from fishermens net; Puget Sound (Lowe); Drier Bay, Alaska (Eyerdam); Wakasa,Japan (Hirano), (San Diego Museum); Puget Sound and Straits of Juan de Fuca (T. Kincaid).

Genus Cymatium Roeding,1798. Type (by subsequent designation,Dall, 1904), Murex femoralis Linnaeus,1758 = Cymatium femorale Roeding.

" Whorls triangular; aperture longer thanthe spire; outer lip dentated internally. Operculum with apical nucleus." (Tryon)

Cymatium corrugatum tremperi Dall,1907. San Pedro to Gulf of California. Type locality, off San Pedro, Calif.

We have the following note from Dr. A. Myra Keen regarding this species and we propose to run the photograph on our next plate. Dr. Keen says " I enclose a photograph of the holotype of tremperi, as I believe it has never been illustrated. Without information as to arrangement of varices, I cannot assign this form subgenerically."

Subgenus Turritriton Dall,1904. Type (by originaldesignation), C. gibbosum (Broderip).

Cymatium gibbosum (Broderip),1833. San Pedro and San Diego,Calif. to Panama. Type locality, Panama.

Collecting data: Tres Marias Islands; Tiburon Island; Mazatlan;La Paz; Panama; Salvador; Costa Rica: (H.N. Lowe); Scammon's Lagoon (Porter) (San Diego Museum of Natural History).

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The following keys and list of species from Mr. A.M. Strong's notebook will be of interest.

Family Cymatiidae

Shell pyriform, with a pointed spire and moderate to long canal
. Whorls regular.. Cymatium
.. Whorls distinctly triangular
... Sculptured with 3 smooth spiral cords only - no dentition
Height 150 mm. Magdalena Bay to Panama .... tigrinus
Reeve pl.8, fig. 27; Tryon vol.3,p.18,pl.10,figs.71,72
... Axial ribs faintly noduled or warty - 4 varicose denticles-
Height 60 mm. San Pedro to Peru .... gibbosus
Reeve pl.13,fig.38; Tryon, vol.3,p.23,pl.12, fig.101.
.. Whorls not distinctly triangular
... Spiral ribs tuberculate over entire surface
Height 85 mm. San Pedro to Gulf of Calif. .... tremperi
Reeve pl.3,fig.13
... Spiral ribs tuberculate on the shoulder only
.... Tubercles large
..... Spiral cords equal, flat,strap like
Height 33 mm. Gulf of Calif. .... adairense
Nautilus 24,p.33; Proc. USNM vol.66, pl.35, fig.1.
..... Spiral cords alternating in size
Height 35 mm. Galapagos .... lineatus
Reeve pl.2,fig.4; Tryon, vol.3, p. 14, pl.8,fig.51.
.... Tubercles small, more or less obsolete
..... Spiral ridges very strong, sometimes double
Height 100 mm. Magdalena Bay to Peru .... costatum
Reeve pl. 10, fig.32; Tryon, vol.3, p. 11
..... Spiral ridges regular, flat,equidistant
Height 65 mm. West coast ? .... cingulatum
Reeve, pl.11, fig.35; Tryon vol.3,p.15
..... Spiral ridges faint, irregular
Height 75 mm. Gulf of Calif. to Peru .... weigmanni
Reeve pl.11, fig.37; Tryon, vol.3, fig.15, pl.9, fig.57.

... Spiral ridges crenulated, not tuberculate

.... Columella and lip blood red, wrinkles white

Height 100 mm. Gulf of Calif. to Peru .... pilearis

Reeve pl. 7,fig.23; Tryon vol. 3, p. 12, pl.6, figs. 31-34.

.... Columella and lip blackish purple, wrinkles white

Height 100 mm. Cerros Island to Peru .... vestitus

Reeve pl. 20, fig.101; Tryon vol.3, fig.12.

.... Columella yellowish, a double row of white teeth

Height 30 mm. Gulf of Calif. to Ecuador .... lignarium

Reeve pl. 13, fig.40; Tryon vol.3,p.15, pl.9,fig.63.

. Whorls distorted .... Distorsio

.. Columella with large, irregular granules

Height 50 mm. Lower Calif. to Panama .... decussata

Reeve pl.12, fig.41; Tryon vol.3,pl.17,fig.176.

.. Columella with strong wrinkles

Height 50 mm. Panama .... ridens

Reeve pl.12 fig.46; Tryon vol.3, pl.17, fig.177

Shell ovate, spire and canal short

. Columella wrinkled or dentate .... Argobuccinum

.. Sculpture nodulous

... Shell brown, banded, rubbed nodules white

Height 100 mm. Chile .... raneliiform

Tryon vol. 3,p.45, pl.24,fig.62; Reeve, Ranella,pl.3,fig.13.

... Shell yellowish brown, columella nearly smooth

Height 50 mm. Chile .... rude

Reeve, Triton,pl.14,fig.53; Tryon, vol.3,p.34,pl.16,fig.169.

.. Sculpture sharply cancellated

Height 60 mm. Ecuador to Chile .... scaber

Reeve, Triton, pl.11, fig. 34; Tryon, vol.3,p.34,pl.16,fig.168.

Genus Cymatium Roeding,1798.

Cymatium (Cabestana) gibbosum (Broderip),1833.	San Pedro to Peru
Cymatium corrugatum tremperi Dall,1907.	San Pedro to Gulf of Calif.
Cymatium vestitus (Hinds),1844.	Cerros Island to Peru
Cymatium costatum (Born),1778.	Cosmopolitan. Magdalena Bay to Peru
Cymatium tigrinum (Broderip),1833.	Magdalena Bay to Panama
Cymatium adairense Dall,1910.	Gulf of California
Cymatium pilearis (Linnaeus),1758.	Cosmopolitan. Gulf of Calif. to Panama
Cymatium weigmanni Anton,1839.	Gulf of Calif. to Peru
Cymatium lignarium (Broderip),1833	Gulf of Calif. to Ecuador
Cymatium amictus (Reeve)	Philippines, West Mexico
Cymatium lineatus (Broderip),1833	Galapagos
Cymatium cingulatum (Lamarck)	Indo-Pacific, Peru
Cymatium anomalum (Hinds),1844	Nicaragua
Cymatium olearum (Deshayes)	West Indies, Gulf of Calif.

Genus Distorsio Roeding,1798.

Distorsio decussata (Valenciennes),1833.	Lower Calif. to Peru
Distorsio constricta (Broderip),1833	Central America to Panama

Genus Argobuccinum Klein,1846

Argobuccinum scabrum (King),1831.	Ecuador to Chile
Argobuccinum rude (Broderip),1833	Chile
Argobuccinum ranelliformis (King),1831.	Chile

Genus Tritonharpa Dall,1908.

Tritonharpa vexillata Dall,1908.	Galapagos

Genus Craspedotriton

Craspedotriton scalariformis (Broderip),1833.	Gulf of Calif. to Panama

Family Seguenziidae

Genus Seguenzia Jeffreys, 1876. Type (by subsequent designation, Harris, 1897), Seguenzia formosa Jeffreys. Fide Woodring, p. 327, 1928.

" Shell small, trochoid, somewhat nacreous. Nucleus strongly inflated, rising abruptly from apex of shell, consisting of about one whorl. Aperture ovate. Outer lip bearing at suture a deep, narrow and sinus, and also a shallow sinus at periphery and base. Basal lip everted below columella, producing a suggestion of a canal. Columella ending in a tooth-like projection. Inner lip reflected over a narrow umbilical opening in type species. Sculpture consisting of sharp spiral ridges and very fine spiral threads, and of axial threads curved in conformity to shape of outer lip." (Woodring).

Seguenzia certoma Dall, 1919. Off San Diego, Calif. in 600 fathoms.
Seguenzia giovia Dall, 1919. Off Catalina Island, Calif. in 118 fathoms.
Seguenzia cervola Dall, 1919. Off North Coronado Island in 692 fathoms.
Seguenzia calliana Dall, 1919. Off La Jolla and San Diego, Calif. in 243 to 822 fathoms. Type locality, off San Diego in 417 fathoms.

Dr. Joshua L. Baily Jr. commentsas follows: " Some taxonomists have placed the Seguenzidae between the Trochidae and the Neritidae. I don't know, but I think it might be well to mention the fact."

Family Triphoridae

Genus Triphora Blainville, 1828. Type (by monotypy), Triphora gemmatum Blainville (= Cerithium tristoma Blainville).

" Shell very small, slender, sinistral. Aperture subcircular. Anterior canal short, curved backward, slightly emarginate, upper part almost or completely closed. Anal notch small, closed in some species and located some distance from aperture. Sculpture consisting of spiral rows of beads joined by axial threads." (Woodring, p. 328, 1928).

The most important reference on this group is Bartsch, Paul, Proc. U.S. N.M., no. 1569, vol. 33, pp 249-262, pl. 16 " The West American Mollusks of the Genus Triphoris", 1907.

Triphora montereyensis Bartsch, 1907. Monterey, Calif.
Collecting data: Dredged off Monterey in 15 fms. (Burch).

Triphora pedroana Bartsch, 1907. Redondo Beach, Calif. to San Geronimo Island. Type locality, San Pedro, Calif.

Collecting data: A not uncommon small species in littoral collecting at minus tides along the Palos Verdes from Malaga Cove to Point Firmin, Los Angeles Co. They seem in our experience to have a particular habitat on certain stones covered with a fine worm tube growth. Quite common along the inside of the Balboa, Calif. breakwater. Also dredged off Redondo Beach as deep as 25 fms. in gravel. (Burch); So. Coronado Island in 10 fms. (Baker); San Geronimo Island (Lowe); San Diego (Baker); La Jolla (Bristol); Laguna (Lowe); Pt. Vicente (Strong); Half Moon Bay (Baker). Dr. Joshua L. Baily Jr. reports " In the beach drift at La Jolla there are two distinct forms of Triphora , but Dr. Bartsch has examined all material and calls them all T. pedroana. The radula of Triphora is said to be quite peculiar. I have never examined it."

Triphora callipyrga Bartsch, 1907. San Pedro and Catalina Island to San Martin, L.C. (Baker). Type locality, San Pedro, Calif.
Collecting data: San Martin Island, L.C. (Baker); Catalina Island in 35 fms. (Lowe).

Triphora carpenteri Bartsch, 1907. Neah Bay, Wash.

Triphora catalinensis Bartsch, 1907. Catalina Island and Laguna Beach (Dall) to San Martin Island, L.C. (Baker). Type locality, Catalina Island.

Collecting data: San Martin Island, L.C. (Baker); La Jolla (Chaney and Bristol).

Triphora stearnsi Bartsch, 1907. San Diego, Calif. to the Gulf of Calif. Type locality, Gulf of California.

Collecting data: Gulf of Calif. (Baker). " The type of T. stearnsi is said to be flesh colored. The median cord is faint, even on the last whorl. The figure shows a worn shell with both the tip and aperture broken." (Strong).

Triphora peninsularis Bartsch, 1907. San Diego, Calif. to Point Abreojos, L.C. Type locality, Point Abreojos, Lower Calif.

Collecting data: Espiritu Santo Island, Gulf of Calif. (Lowe). " T. peninsularis is uniformly dark brown. The median cord begins to develop on the fifth postnuclear whorl and gradually increases in strength until on the last whorl the three spiral cords are about equal in strength." (Strong).

Mr. A.M. Strong comments upon some of the above mentioned species as follows: " Triphora pedroana is uniformly dark brown. The medial spiral cord begins to develop on the fourth postnuclear whorl and increased in strength until on the last whorl it is stronger than the anterior cord." Triphora callipyrga differs from all other species on the west coast in having three spiral cords on all postnuclear whorls of which the median is the strongest. The shell is uniformly light brown. Triphora catalinensis has the posterior half of the whorls white and the anterior half light brown. The median cord is faint and does not begin to develop until the 7th postnuclear whorl. The type is a young shell and the figure does not show the adult base."

The following key and list of species if from Mr. A.M. Strong's notebook.

Genus Triphora

All postnuclear whorls with 3 tuberculate spiral cords
. Median cord the strongest of the 3
5.2 x 2.2. mm. San Pedro to San Martin Island ...... callipyrga Bartsch
. Median cord not the strongest of the three
.. Tubercles of all cords truncated
2.8 x 1.1 mm (young) Galapagos .... chathamensis Bartsch
.. Tubercles not truncated
3.5 x 1.0 mm. Gulf of California ....cookeana Baker
Upper whorls with 2, later whorls with 3 tuberculate cords
. Median cords on last whorl the strongest
.. Pits between axial ribs and spiral cords ill defined
3.2 x 1.1 mm. (young) Galapagos .... galapagensis
.. Pits between axial ribs and spiral cords well defined
... Pits deep, rounded
5.1 x 1.9 mm. San Pedro to Guadalupe Island .... pedroana Bartsch
... Pits subrhomboid
8.0 x 2.13 Gulf of California .... contrerasi Baker
. Median cord on last whorl not the strongest
.. Median cord equalling posterior or anterior on last whorl
... Pits between axial ribs and spiral cords ill defined
.... Tubercles of one or more cords truncated
..... Tubercles of posterior cord on last whorl the strongest
7.45 x 2.40 mm. Gulf of California .... chamberlaini Baker

..... Tubercles of all cords on last whorl equal
2.77 x 1.20 Gulf of California............. evermanni Baker
.... Tubercles not truncated
..... Tubercles small, more than 20 on last whorl
2.4 x 0.95 Gulf of California .... slevina Baker
..... Tubercles large, less than 20 on the last whorl
...... Peripheral cord narrow, tuberculate
4.55 x 1.69 mm. Gulf of California .... oweni Baker
...... Peripheral cord sinuous, scarcely tuberculate
4.0 x 1.75 mm. Gulf of California .... stephensi Baker
... Pits between axial ribs and spiral cords well defined
.... Pits deep, square
..... Tubercles not truncated
4.50 x 1.62 mm. Gulf of California .... escondidensis Baker
..... Tubercles of one or more cords truncated
...... Axial ribs uniformly retractive
4.0 x 1.5 mm. San Diego to Tres Marias Islands.. peninsularis Bartsch
...... Axial ribs angulated at the median cord
3.2 x 1.1 mm. Panama .... palmeri Strong & Hert.
.... Pits rectangular or oblong
..... Tubercles on one or more cords truncated
...... Tubercles of posterior cord the strongest
8.17 x 2.43 mm. Gulf of California .... hannai Baker
...... Tubercles of all cords equal on last whorl
4.8 x 1.5 mm. Panama .... alternata C.B. Adams
..... Tubercles not truncated
3.7 x 1.6 mm. Gulf of Calif. .... excolpta Bartsch
.. Median cord the weakest on the last whorl
... Pits between axial ribs and spiral cords ill defined
.... Tubercles of one or more cords truncated
6.5 x 2.0 mm. San Diego to Panama .... dalli Bartsch
.... Tubercles not truncated
..... Tubercles of posterior cord stronger than anterior
...... Axial ribs strongly protractive
8.8 x 2.0 mm. Gulf of California .... johnsoni Baker
...... Axial ribs not strongly protractive
3.4 x 2.1 mm. Galapagos .... adamsi Bartsch
..... Tubercles of anterior and posterior equal
5.3 x 2.2 mm. Catalina Island to San Martin id...catalinensis Bartsch
... Pits between axial ribs and spiral cords well defined
.... Pits deep, square
..... Tubercles of anterior cord truncated
5.1 x 1.8 mm. Gulf of California .... vanduzeei Baker
..... Tubercles not truncated
...... Tubercles of posterior and anterior cords equal
8.7 x 2.2 mm. Panama .... panamensis Bartsch
...... Tubercles of posterior cord stronger than anterior
4.1 x 1.1 mm. Panama ....inconspicua C.B. Adams
.... Pits oblong or rectangular
..... Tubercles of one or more cords truncated
...... Tubercles of posterior cord large, rounded
4.66 x 1.33 mm. Panama .... marshi Strong & Hertlein
...... Tubercles of posterior cord excavated posteriorly
5.1 x 1.6 mm. Pt. Sbreojos .... hemphilli Bartsch
..... Tubercles not truncated
4.1 x 1.1 mm. Gulf of California .... stearnsi Bartsch.

Genus Triphora Blainville,1828.

Triphora pedroana Bartsch,1907.	San Pedro to Coronado Islands
Triphora callipyrga Bartsch,1907	San Pedro to San Martin Island
Triphora catalinensis Bartsch,1907	Catalina Island
Triphora dalli Bartsch,1907.	San Diego to Panama.
Triphora peninsularis Bartsch,1907.	San Diego to Tres Marias Islands
Triphora stearnsi Bartsch,1907.	San Diego to Gulf of Calif.
Triphora hemphilli Bartsch,1907	Pt. Abreojos
Triphora excolpus Bartsch,1907	Cape San Lucas
Triphora hannai Baker,1926	Gulf of Calif.
Triphora evermanni Baker,1926	Gulf of Calif.
Triphora vanduzeei Baker,1926	Gulf of Calif.
Triphora contrerasi Baker,1926	Gulf of Calif.
Triphora slavini Baker,1926	Gulf of Calif.
Triphora oweni Baker,1926	Gulf of Calif.
Triphora johnstoni Baker,1926	Gulf of Calif.
Triphora chamberlaini Baker,1926	Gulf of Calif.
Triphora escondidensis Baker,1926	Gulf of Calif.
Triphora cookeana Baker & Spicer,1935	Gulf of Calif.
Triphora stephensi Baker & Spicer,1935	Gulf of Calif.
Triphora inconspicua C.B. Adams,1852	Panama
Triphora alternatus C.B. Adams,1852	Panama
Triphora panamensis Bartsch,1907.	Panama to Ecuador
Triphora adamsi Bartsch,1907.	Galapagos- Nicaragua
Triphora palmeri Strong & Hertlain,1939	Taboga Island, Panama
Triphora marshi Strong & Hertlein,1939	Bahia Honda, Panama
Triphora galapagensis Bartsch,1907.	Galapagos
Triphora chathamensis Bartsch,1907.	Galapagos

ADDITION

Triphora dalli Bartsch,1907. Proc. USNM, no. 1569, vol. 33, pp 257-258, Pl. 16, fig.14, 1907. Type locality, Bay of Panama in 18 fms.

This species has not been regarded as a member of our fauna from San Diego northward. However, Mr. Strong's notebook lists a record from San Diego (Kelsey Coll.). There are several records of it from the Tres Marias Islands, Gulf of Calif. etc.

If Kelsey's record is good the range would be from San Diego to Panama.

Mr. Strong says of the species " Triphora dalli (Bartsch) is irregularly variegated with varying shades of brown,yellow and white. The median cord begins to develop on the fourth postnucular whorl and does not equal the strength of the other two, even on the last whorl. The entire surface is crossed by microscopic spiral and axial lines."

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Family Cerithiopsidae

Genus Cerithiopsis Forbes and Hanley,1851. Type (by monotypy),Murex tubercularis Montagu. Dr. A. Myra Keen advises " The date of Cerithiopsis Forbes and Hanley is 1851 (fide Sherborn).

The following description by Mr. A.M. Strong applies to the family. " Shell small,slender,turrited or subcylindrical,sculptured with two to four spiral cords, axial sculpture fainter or absent. The aperture is small with a short, truncated, straight canal."

The following keys to genera and species are from Mr. A.M. Strong's notebook. Following his list of species we will take up a detailed discussion of the species reported north of San Diego.

Family Cerithiopsidae

Genus
Spiral cords smooth, not tuberculate .... Seila
Spiral cords tuberculate
. Base truncate, shell exceedingly slender .... Metaxia
. Base not truncate, shell stouter .... Cerithiopsis
.. All nuclear whorls smooth .... (Cerithiopsis s.s.)
.. Lower nuclear whorls sculptured
... Sculpture of axial ribs only ....(Cerithiopsina)
.. Both axial and spiral sculpture present
... Fine spiral lirae in interspaces between axial tibs ..(Cerithiopsidella)
... Last nuclear whorl with two spiral cords ....(Cerithiopsida)

Genus Cerithiopsis
Spiral cords between sutures ~~two~~ Gulf of Calif. .... porteri B. H. & S
Spiral cords between sutures more than 2
. Spiral cords between sutures 3
.. Posterior spiral cord weakest on all whorls
... Sutures strongly channeled
.... Shell stout
..... Basal cords strong Monterey to Coronado Island.. berryi Bartsch
..... Basal cords feeble San Pedro to Coronado Island.. bakeri Bartsch
.... Shell slender Galapagos .... galapagensis Bartsch
... Sutures not channeled
.... Tubercles truncated posteriorly
..... Truncation sharp Panama .... neglecta C.B. Adams
..... Truncation moderate Guadalupe Island .... guadalupensis Strong
.... Tubercles rounded, not truncate
..... Whorls slopingly shouldered Lower Calif. ... halia Bartsch
..... Whorls not slopingly shouldered
...... Pits between cords equal
.... Pits rounded San Diego to Gulf of Calif. .... grippi Bartsch
.... Pits square
.... Shell stout San Pedro to Coronado Island.... diegensis Bartsch
.... Shell slender Panama .... adamsi Bartsch
.. Posterior spiral cord equalling the others on later whorls
... Sutures strongly channeled
.... Basal cords 2
..... Shell elongate ovate Galapagos .... curtata Bartsch
..... Shell elongate conic
...... Ribs and cords equal San Pedro to Pt. Abreojos.. oxys Bartsch
...... Ribs feeble, cords strong Tres Marias Ids. to Panama- anaitis Bartsch
.... Basal cords more than 2
..... Basal cords 3 Gulf of Calif. .... cerea Carp.
..... Basal cords 9 Gulf of Calif. ....sorex Carp.
... Sutures not strongly channeled
.... Shell less than 3 mm. in length
..... Shell stout, more or less pupiform
...... Pits between cords small, irregular
.... Pits about equal in size Cape San Lucas ...... brostolae B.H.&S
.... ~~Tubercles rounded, not truncated~~
.... Basal cords 2 Gulf of Calif. .... pupiformis Carpenter
.... Basal cords 3 Panama ....eisseni S. & H.
..... Shell slender, elongate conic Pt. Abreojos ..... abreojosensis Barts ch
.... Shell more than 3 mm. in length
..... Shell 3 to 5 mm. in length
...... Base smooth Galapagos ....bicolor Bartsch
(con.)

...... Base sculptured
.... Base with sublamellar keels Panama .... infrequens C.B. Adms.
.... Base with rounded cords
.... Basal cords 5 Panama .... montezumi S. & H.
.... Basal cords 1 or 2
.... Peripheral cord exposed in suture Cape San Lucas.. kinoi B,H.&S
.... Peripheral cord not exposed in suture
.... Axial ribs on last whorl 32 San Pedro to Pt. Abreojos.... pedroana Bartsch
.... Axial ribs on last whorl 20-22
.... All tubercles rounded Gulf of Calif. .. tuberculoides Carpenter
.... Tubercles truncated posteriorly
.... Basal cord slender Gulf of Calif. ..... subgloriosa B,H. & S
.... Basal cords strong Panama .... gissleri S. & H.
..... Shell over 5 mm. in length
...... Basal cord 1, slender San Pedro to San Bartolome..carpenteri Bartsch
...... Basal cords more than 1
.... Basal cords 3, equal Monterey to San Bartolome.. cosmia Bartsch
. Spiral cords between sutures 4
.. Spiral cords wider than the interspaces Peru ..... peruviana d'Orbigny
.. Spiral cords narrower than the interspaces
... Spiral cords subequal Cape San Lucas .... aurea Bartsch
... Spiral cords decidedly unequal Panama ....destrugesi de Folin

Family Cerithiopsidae

Genus Seila A. Adams, 1861.

Seila montereyensis Bartsch, 1907. Monterey to Todos Santos Bay
Seila assumillata (C.B. Adams), 1852 Gulf of Calif. to Peru

Genus Metaxia Monterosato, 1884

Metaxia diadema Bartsch, 1907. Monterey to Gulf of Calif.
Metaxia convexa (Carpenter), 1856 San Pedro to Panama

Genus Cerithiopsis Forbes and Hanley, 1851.

Subgenus Cerithiopsis s.s.

Cerithiopsis oxys Bartsch San Pedro to Pt. Abreojos
Cerithiopsis carpenteri Bartsch, 1911 San Pedro to Lower Calif.
Cerithiopsis pedroana Bartsch, 1907 San Pedro to Pt. Abreojos
Cerithiopsis bakeri Bartsch, 1917. Reef Pt. to Coronado Islands
Cerithiopsis berryi Bartsch, 1911 Monterey to Coronado Islands
Cerithiopsis grippi Bartsch, 1917 Reef Point to San Diego
Cerithiopsis cesta Bartsch, 1911 San Diego
Cerithiopsis halia Bartsch, 1911 Todos Santos Bay to Cape San Lucas
Cerithiopsis abreojosensis Bartsch, 1911 Pt. Abreojos
Cerithiopsis guadalupensis Strong, 1938. Guadalupe Island
Cerithiopsis pupiformis (Carpenter), 1857 Gulf of Calif.
Cerithiopsis aurea Bartsch, 1911. Cape San Lucas
Cerithiopsis cerea Carpenter, 1857 Mazatlan
Cerithiopsis sorex Carpenter, 1857 Mazatlan
Cerithiopsis tuberculoides Carpenter, 1857 Gulf of Calif. to
Cerithiopsis albonodosa Carpenter, 1857 Mazatlan
Cerithiopsis subgloriosa B.H. & S., 1938 Gulf of Calif.
Cerithiopsis anaitis Bartsch Panama
Cerithiopsis galapagensis Bartsch Galapagos
Cerithiopsis gissleri Strong & Hertlain, 1939 Bahia Hondo
Cerithiopsis montezumi Strong & Hertlein, 1939 Bahia Hondo

Subgenus Cerithiopsida

Cerithiopsis diegensis Bartsch, 1911 San Pedro to Coronado Islands

(con.)

Cerithiopsis rowelli Bartsch,1911	California
Cerithiopsis bristolae B. H. & S.,1938	Gulf of Calif.
Cerithiopsis cassi B. H. & S., 1938	Cape San Lucas
Cerithiopsis kinoi B. H. & S.,1938	Cape San Lucas
Cerithiopsis porteri B. H. & S., 1938	Gulf of Calif.
Subgenus Cerithiopsidella	
Cerithiopsis cosmia Bartsch,1907.	Monterey to San Bartolome Bay
Cerithiopsis fia Bartsch,1927.	Monterey to Laguna
Cerithiopsis alcima Bartsch,1911	San Pedro to San Geronimo ~~Bay~~ Island
Cerithiopsis antifilosa Bartsch,1911	San Pedro to San Diego
Subgenus Cerithiopsina	
Cerithiopsis adamsi Bartsch,1911	Panama
Subgenus ?	
Cerithiopsis antemunda Bartsch,1911	San Pedro to San Diego
Cerithiopsis diomedae Bartsch,1911	San Diego to Todos Santos Bay
Cerithiopsis gloriosa Bartsch,1911	San Diego
Cerithiopsis arnoldi Bartsch,1911	San Pedro
Cerithiopsis lohri Jordan	Magdalena Bay, Pleistocene
Cerithiopsis neglecta C.B. Adams,1852	Panama
Cerithiopsis infrequens C.B. Adams,1852	Panama
Cerithiopsis destrugesi de Folin,1867	Panama
Cerithiopsis eiseni Strong & Hertlein,1939.	Bahia Honda
Cerithiopsis curtata Bartsch,1911	Galapagos
Cerithiopsis bicolor Bartsch,1911	Galapagos
Cerithiopsis peruviana d'Orbigny,1840	Peru

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Genus Cerithiopsis Forbes and Hanley,1851.
Subgenus Cerithiopsis s.s.

Cerithiopsis oxys Bartsch,1911 Cayucos,Calif. to Cape San Lucas, Mexico
Type locality, Point Abreojos, L.C., Mexico.

" Shell minute,dark brown, with three equal, tuberculate spiral cords, the tubercles on the upper cords rounded , on the median and lower cord truncated posteriorly. The periphery is marked by a strong cord with a second strong cord on the middle of the base." (A.M. Strong).

Collecting data: Cayucos,Calif.; Reef Point; (Strong); dredged off Redondo Beach, Calif. in 75 fms.; off Avalon, Catalina Island in 35 fms.; littoral on rocky reef at Arbolitos, Lower Calif., around the point from Punta Banda, the open surf (Burch); San Pedro (Lowe); San Martin Island, L.C. (Baker); Bird Rock and Ocean Beach (Baker); San Hipolito,L.C. (Hemphill) (San Diego Museum).

Crescent City, Calif. (Burch)
Cerithiopsis carpenteri Bartsch,1911. Venice, Calif. (Burch) to the Estero, Ensenada,Mexico (Burch). Type locality, Terminal Island, San Pedro Calif.

" Shell large for the genus,dark chocolate brown. Of the three tuberculate spiral cords the one at the summit is slightly the largest with the tubercles well rounded,the tubercles of the median cord are slightly truncated posteriorly and those of the anterior cord sharply so. Periphery marked with a deep groove, immediately below which is a broad cord. Base without additional sculpture." (A.M. Strong).

Collecting data: From sponge growing on the pilings under the Venice, Calif. amusement pier, Jan. 1940; dredged off Redondo Beach in 15 fms.; on sponge from Mission Bay, San Diego Co.; on sponge from Arbolitos,L.C.; also Punta Banda,L.C.; very abundant on sponge inside the Estero below Ensenada,Mexico; on sponge from wharf piles in Anaheim Bay; Crescent City, Calif. Aug.1936 (Burch); Spanish Bight, Coronado (Berry); San Diego Bay

(Baker); San Geronimo Island, L.C. (Lowe); Laguna Beach and Alamitos Bay (Lowe); Point Loma, San Diego Co. (W.K. Emerson).

Cerithiopsis pedroana Bartsch, 1907. San Pedro, Calif. to Point Abreojos, L.C. *Type locality*, Terminal Island, San Pedro, Calif.

" The shell is rather large for the genus, dark brown, sculptured with three tuberculate spiral cords of which the upper is slightly smaller. The tubercles of the upper and median cords are axially elongated and those of the lower cord truncated posteriorly. The periphery is marked by a strong cord with a second strong cord on the middle of the base."

Collecting data: Common on yellow sponge growing on the eel grass in Mission Bay, San Diego Co. Jan.3, 1940.(Burch); Anaheim Bay on sponge on oysters; So. Coronado Island (Baker); San Diego Bay (Baker); Catalina Island (Lowe); Coronado (Lowe) (San Diego Museum).

Cerithiopsis berryi Bartsch, 1911. Monterey, Calif. to Point Abreojos, L.C. (Jordan). *Type locality*, 12 fathoms off Del Monte, Calif.

" Upper of the three nodulous spiral cords much the weaker on the upper whorls, on the last whorl almost equalling the other two. Periphery marked by a broad sulcus, immediately below which is a broad, rounded spiral cord and a second smaller cord on the middle of the base, while a third slender thread encircles the insertion of the columella . All tubercles are truncated posteriorly. The shell is uniformly brown." (A.M. Strong).

Collecting data: South Coronado Island (Baker); North Coronado Island (Stephens); La Jolla (Chaney) (San Diego Museum).

Cerithiopsis cesta Bartsch, 1911. San Diego, Calif. *Type locality*, Government Jetty, San Diego. Figured by Oldroyd.

Cerithiopsis stejnegeri Dall, 1884. Commander, Aleutian and Shumagin Islands, Alaska. *Type locality*, Bering Island. - to Queen Charlotte Ids.(Lowe)

Collecting data: Queen Charlotte Islands, B.C. (Lowe Coll. in San Diego Museum).

Cerithiopsis stejnegeri dina Bartsch, 1911. Sitka, Alaska.

Cerithiopsis grippi Bartsch, 1917. Off Newport, Calif. to Cape San Lucas, L.C. (Strong). Type locality, off San Diego.

" Shell chestnut brown, with the three spiral cords about equal. The tubercles of the upper and median spiral cords are well rounded while those on the lower cord are truncated posteriorly. Periphery of the last whorl marked by a broad groove. Base with two spiral grooves, one near the middle and the other encircles the insertion of the columella" (A.M. Strong).

Collecting data: 10 fms. Reef Point (Strong); uncommon in sand at La Jolla (W.K. Emerson); Ocean Beach (Baker).

Cerithiopsis halia Bartsch, 1911. *Proc. U.S.N.M., 40:344, pl.40, fig.8, no. 1823, 1911.* San Diego, Calif. (Wildon) to Cape San Lucas, L.C. Type locality, Todos Santos Bay, L.C.

Inasmuch as this species was not listed in Bull. 112 nor the description in Oldroyd we are copying the original description as follows:

" Shell amsll, broadly elongate-conic, chocolate brown. (Early nuclear whorls decollated). Only the last volution remains, which is smooth. Post-nuclear whorls strongly shouldered at the summit on early whorls, ornamented with three spiral cords, of which the first, at the summit, is very poorly developed; the second is situated at the posterior termination of

(con.)

the anterior third between the sutures; while the third which equals the second, is about halfway between this and the suture. In addition to the spiral cords, the whorls are marked by decidedly retractive, axial ribs which are almost equal to the spiral cords in strength. Of these ribs, 12 occur upon the first, 14 upon the second, 16 upon the third and fourth, 18 upon the fifth, and 20 upon the penultimate turn. The intersections of the axial ribs and spiral cords form well-rounded tubercles, while the spaces inclosed by them are elongated pits between the first and second spiral cord, and large, squarish pits between the second and third. Periphery of the last whorl marked by a sulcus not quite as broad as that which separates the supraperipheral from the median cord, and crossed by the continuations of the axial ribs. Base short, concave, marked by two spiral cords immediately below the peripheral sulcus and by numerous fine, incremental lines. Aperture subquadrate, decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered sinuous at the edge by the external sculpture which is apparent in the aperture; columella short, curved, and twisted, with the free edge reflected; parietal wall glazed with a thin callus.

We have three specimens of this species, none of them quite mature. Cat. No. 32399, U.S.N.M., contains the type and another specimen from Todos Santos Bay, Lower California. The type has eight post-nuclear whorls and measures: Length 4.5 mm., diameter 2.1 mm. The third specimen (Cat. No. 16196)U.S.N.M.) comes from Cape San Lucas, Lower California"

Mr. A.M. Strong comments on this species as follows: " The upper of the three tuberculate spiral cords is much weaker than the other two and the tubercles on all cords are rounded, not truncated. The figure shows a young shell which has not developed the basal sculpture of the adult."

Collecting data: Point Loma, San Diego Co. (Miss E. Wilson); San Martin Island, L.C. and So. Coronado Island (Baker).

Cerithiopsis diomedae Bartsch, 1911. San Diego, Calif. to Todos Santos Bay. Type locality, San Diego Bay, Calif.

Dr. Dall placed this species here in Bulletin 112, but Mr. A.M. Strong states that the nuclear whorls are unknown and therefore the subgeneric classification is uncertain. He comments upon the species as follows:

" Shell brown, sculptured with three spiral cords of which the upper is the weaker. The periphery is marked by a strong cord and the base has a single, obsolete fasciole near the insertion of the columella."

Cerithiopsis paramoea Bartsch, 1911. Neah Bay, Washington.

Cerithiopsis bakeri Bartsch, 1917. Off Newport, Calif. to San Martin Island, Lower Calif. Type locality, 7-10 fms. off South Coronado Island, L.C.

" Of the three nodulous spiral cords the one at the summit of the whorls is much the weakest on all whorls. The tubercles of the median and lower spiral cords are truncated posteriorly and the periphery is marked by a deep sulcus immediately below which is a strong spiral cord. Other spiral sculpture on the base consists of two fine threads. The shell is chestnut brown."

Collecting data: San Martin Island, L.C.; So. Coronado Island in 7-14 fms.; Bird Rock, San Diego Co. (Dr. F. Baker). 10 fms. Reef Point (Strong).

Cerithiopsis charlottensis Bartsch, 1917. Prince William Sound, Alaska (W.J. Eyerdam- Nautilus 38:26) to Puget Sound. Type locality, Queen Charlotte Islands, B.C. in 60 fms.

Cerithiopsis montereyensis Bartsch, 1911. Little River, Mendocino Co. to Monterey, Calif. Type locality, Monterey Harbor, Calif.

Subgenus Cerithiopsida Bartsch, 1911.

Cerithiopsis diegensis Bartsch, 1911. Redondo Beach, Calif. (Burch) to La Jolla and San Clementeand South Coronado Island, to Arbolitos, Mex. (Burch). Type locality, San Diego, Calif.

Collecting data: off Redondo Beach, Calif. in 25 fms. gravel; off Catalina Island in 35 fms.; Arbolitos, L.C., Mexico (around the point south of Todos Santos Bay). (Burch); Bird Rock, La Jolla (Baker); Pt. Vicente; Reef Pt.; Pt. Loma, San Diego Co. (Strong).

" Shell chestnut brown, sculptured with three tuberculate spiral cords, the posterior beginning as a slender thread on the third post nuclear whorl and increasing in size until it about equals the other two on the last whorl. The periphery is marked by a strong cord, base smooth except for a slender thread at the insertion of the columella. This is the type of the subgenus" (A.M. Strong).

Cerithiopsis rowelli Bartsch, 1911. Range ? Type locality stated to be from " Haliotis, West coast of Northand Middle America". Bartsch states " It probably came from California".

Cerithiopsis gloriosa Bartsch, 1911. Point Firmin, Los Angeles Co., Calif. (Strong) south to Point Abreojos, L.C. (Eric Jordan).
Type locality, Off San Diego, Calif. in 15 fms.

Collecting data: San Hipolito, L.C. (Hemphill) (San Diego Museum).

Cerithiopsis antemunda Bartsch, 1911. Mugu, Ventura Co., Calif. (Burch) south to Estero of Todos Santos Bay, L.C. (Burch). Type locality, off San Diego, Calif.

Collecting data: Mugu, Ventura Co., Calif. on sponge; dredged off Redondo Beach, Calif. in 50 fms. rockand gravel; very abundant on yellow sponge inside the Estero de Todos Santos Bay. (Burch).

Subgenus Cerithiopsidella Bartsch, 1911

Cerithiopsis cosmia Bartsch, 1907. Moss Beach, San Mateo Co. (H.E. Vokes) to San Bartolome Bay, L.C., Mexico. Type locality, White's Point, San Pedro, Calif.

Mr, A.M. Strong notes " Questionably from the Gulf of California"

" Shell variegated with various shades of brown, white and wax yellow, sculptured with three tuberculate spiral cords of which the upper is the weakest on the first four postnuclear whorls but gradually increasing in strength until on the last whorl it is the strongest of the three. The periphery is marked with a spiral keel and the base with three spiral cords. This is one of the largest species in the genus and the color pattern is quite distinctive. It is the type of the subgenus." (A.M. Strong).

Collecting data: This is by far the most common species of the genus in our experience , with a great many collecting localities; Malaga Cove, Point Vicente, Dana Point; wharf pilings off Redondo Beach; Punta Banda, L.C.; Bird Rock, San Diego Co.; Arbolitos, L.C.; off Avalon, Catalina Island in 35 fms.; Portuguese Bend; Monterey, Calif. from Haliotis rufescens covered with sponge. (Burch); So. Island, Coronado Islands (Baker); San Martin Island, L.C. (Baker); Ocean Beach and San Diego (Baker); La Jolla (Bristol and Chaney); Laguna, San Pedro and White's Point (H.N. Lowe) (San Diego Museum).

Cerithiopsis antefilosa Bartsch, 1911. Redondo Beach, Calif. (Burch) south to San Hipolite Point (Eric Jordan). Type locality, 8 miles off Point Loma Light, Calif.

(con.)

Collecting data: Off Redondo Beach in 25 fms. gravel; Malaga Cove in 10 fms.; off Avalon, Catalina Island in 35 fms.; Dana Point, Calif.; Pleistocene os San Pedro, Timm's Point and also of Baldwin Hills (Burch); South Coronado Island in 7 to 10 fms. (Baker); San Hipolito, L.C. (Hemphill) (San Diego Museum).

Crescent City, Calif. (Cooper)

Cerithiopsis aleima Bartsch,1911. Monterey, Calif. (Burch) south to San Geronimo Island (Lowe- Nautilus, vol. 27, p.27).
Type locality, White's Point, San Pedro, Calif.

" Shell chestnut brown, sculptured with three tuberculate spiral cords of which the upper is faint on the first five whorls, beginning on the sixth whorl it begins to increase in strength until on the last whorl it almost equals the other two. Periphery marked by a spiral cord, base with two strong cords and a slender fasciole." (A.M. Strong).

Collecting data: Off Monterey, Calif. in 15 fms.; off Redondo Beach, in 15 fms. (Burch); South Coronado Island in 7 to 10 fms. (Baker); San Geronimo Island, L.C. (Lowe); La Jolla (Chaney); Laguna (Lowe); Crescent City (Cooper) (San Diego Museum).

Cerithiopsis onealensis Bartsch,1921. Proc. Biol. Soc. Wash. 34:35.
Type locality, off O'Neal Island, Puget Sound.

Cerithiopsis fia Bartsch,1927. Proc. U.S.N.M. vol.70, no. 2660 (Apr.8, 1927), art.11, pp.26-27, pl. 5, figs 6,7.

Type locality, Monterey, Calif.

The original description follows: " Shell broadly conic, chestnut-brown. Nuclear whorls decollated excepting a portion of the last turn which has numerous slender distantly spaced, retractively slanting axial threads and numerous fine spiral threads in the intercostal spaces which are placed ar right angles to the axial ribs. Postnuclear whorls moderately rounded, marked by almost vertical axial ribs of which 14 occur upon the first and second, 16 upon the third and fourth, 18 upon the fifth and sixth, 20 upon the seventh, and 22 upon the last turn. These ribs are about as wide as the spaces that separate them. In addition to the axial sculpture, the whorls are marked by three strong spiral cords of which the first at the summit is a little weaker than the rest. These cords render their junction with the axial ribs strongly nodulose. The nodules of the cord at the summit are rounded; those of the other two cords are truncated posteriorly and slope gently anteriorly. The pits inclosed between the axial ribs and spiral cords are almost rounded. Periphery marked by a strong spiral cord which is separated from the first supraperipheral cord by a groove about as wide as that separating that cord from the median of the spire. The groove is crossed by the continuations of the axial ribs which extend feebly over the cord and render it weakly tuberculate. Base short, well rounded, marked by four strong spiral cords which grow successively weaker from these posterior anteriorly. These are separated by grooves much narrower than the width of the cords, and they are rendered slightly tuberculated by the slender continuation of the axial ribs. Aperture subquadrate, decidedly channeled anteriorly; posterior angle obtuse; outer lip thin, showing the external sculpture within, rendered sinuous at the edge by the external sculpture; inner lip sigmoid.

The type, Cat. No. 340935 U.S.N.M., was collected by Mrs. T.S. Oldroyd at Monterey Bay, Calif. It has nine whorls, and measures, length 7.4 mm; diameter, 2.9 mm. Cat. No. 363781, U.S.N.M., contains a younger specimen collected by H.N. Lowe at Laguna, Calif. We give a figure of this also."

Range: Monterey, Calif. to Laguna Beach.

Cerithiopsis santacruzana Bartsch, 1927. Proc. U.S.N.M. vol. 70, no. 2660 (Apr. 8, 1927), art. 11, p 27, pl. 5, fig. 3.
Type locality, Santa Cruz, Calif.

The original description follows: " Shell stout, very broadly conic, pale brown. Early nuclear whorls decollated, the last one and one-half marked by very slender, distantly spaced, decidedly protractively slanting axial riblets, while the broad spaces between them are marked by slender raised threads which are placed at right angles to the axial riblets. Post-nuclear whorls moderately rounded, marked by strong, retractively slanting axial ribs. Of these, 16 occur upon the first to fourth, 18 upon the fifth, 20 upon the sixth and seventh, and 22 upon the penultimate turn. The spaces which separate the axial ribs are about as wide as the ribs. In addition to the axial sculpture, the whorls are marked between summit and suture by three strong spiral cords, of which the first, which is at the summit, is a little weaker than the other two on all the turns but the last. The junction of the axial ribs and spiral cords form strong tubercles which are truncated posteriorly and slope more gently anteriorly. The spaces inclosed between them are roundish pits. Suture moderately impressed. Periphery of the last whorl marked by a rather strong cord. The space separating this from the cords of the spire is crossed by the continuation of the axial ribs, which extend to the cord but do not cross it, nor do they tuberculate it. Base short, moderately rounded, marked by a spiral cord which is a little less strong than the one at the periphery from which it is separated by a channel a little narrower than that separating the peripheral cord from the first supraperipheral. Aperture subquadrate, decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered wavy by the external sculpture; inner lip sigmoid.

The type, Cat. No. 363785 U.S.N.M. comes from Santa Cruz, California. It has 10 whorls and measures, length, 5.9 mm.; diameter, 2 mm. "

Incertae Sedis

Cerithiopsis columna Carpenter, 1864. Vancouver Island to San Diego, Calif. (Hemphill). Type locality, Neah Bay, Washington.

Cerithiopsis arnoldi Bartsch, 1911. San Pedro Bay, Calif.

Cerithiopsis truncata Dall, 1886. Unalaska Island, Alaska to Puget Sound. Type locality, in the canals of sponges at Unalaska.

Cerithiopsis stephensae Bartsch, 1909. Port Frederick, Alaska to Puget Sound. Type locality, Bear Bay, Peril Strait, Alaska.

Cerithiopsis ingens Bartsch, 1907. Monterey, Calif.

Cerithiopsis tumida Bartsch, 1907. Monterey, Calif.

Cerithiopsis fraseri Bartsch, 1921. Clayoquot to Victoria and Nanaimo, British Columbia. Type locality, Clayoquot, B.C.

Range extended northward to Sitkalidak Island (Eyerdam). There is a set in the San Diego Museum from the Oldroyd collection from Kukak Bay, Alaska. Proc. Biol. Soc. Wash. 34:34

Cerithiopsis willetti Bartsch, 1921. Forrester Island, Alaska to Puget Sound. Type locality, Forrester Island, Alaska.
Proc. Biol. Soc. Wash. 34:36

Cerithiopsis signa Bartsch,1921. Proc. Biol. Soc. Wash. 34:36
Off O'Neal Island, Puget Sound.

Cerithiopsis sassetta Dall,1919. # 2295, Proc. U.S.N.M., vol. 56, pp 344-345. Off Point Pinos, Monterey Bay, in 66 to 69 fathoms, green mud.

The description of this species seems to have been left out by Mrs. Oldroyd. The original description follows:

" Shell small, slender, white with a pale olive periostracum, with more than seven whorls, the apex being eroded, the whorls moderately rounded, the suture distinct, not appressed; spiral sculpture of (on the spire four, on the last whorl five) equal and equally spaced roundedd cords with m more or less intercalary minute threading, on the early whorls; the anterior pair of cords are somewhat more prominent than the others; the base is disk-like, flattish, with six or more feeble spiral threads between the carinate margin and the imperforate axis; axial sculpture of (on the penultimate whorl about 17) rounded retractively arcuate riblets, with wider interspaces somewhat nodulous at intersections with the spiral cords, and becoming obsolete on the last whorl, on the spire they extend from suture to suture and on the last whorl to the base; there isalso irregular incremental threading; aperture ovate, lips simple, sharp, a shallow sulcus next the anterior end of the pillar lip; height, 6.5; diameter 2.5 mm. U.S. Nat. Mus. Cat. No. 271062. "

We seem to have no Recent species of the subgenus Cerithiopsina , but the species Cerithiopsis necropolitana Bartsch,1911 is not uncommon as a Pleistocene fossil in the Timm's Point, San Pedro deposit.

Genus Seila A. Adams, 1861. Type (by subsequent designation Dall, 1889, Bull. Mus. Comp. Zool. Harvard College, vol.18, p. 250).- Seila dextroversus (Adams and Reeve) (Triphoris dextroversus Adams and Reeve). Recent Japan. (Fide Woodring, 1928).

" Shell small, very slender, whorls flat. Nucleus broken off on all available specimens of type species. Aperture broadly ovate, deeply notched at the base, though there is virtually no canal. Siphonal fasciole inflated, limited by a thread. Sculpture consisting of strong spiral keels (3 to a whorl on spire) between which lie microscopic growth threads." (Woodring).

Seila montereyensis Bartsch,1907. Monterey, Calif. to Gulf of California. Type locality, Monterey, Calif.

Collecting data: Monterey, Calif. in 20 fms. shale bottom; also in 10 fms. ; off Redondo Beach littoral to 25 fms.; off Avalon, Catalina Island in 35 fms.; common littoral species at Malaga Cove, Point Vicente, Pt. Fermin, Dana Point, San Onofre, Bird Rock, La Jolla etc. (Burch); San Martin Island, L.C. (Baker); San Felipe, L.C. (Stephens); Magdalena Bay (Porter); Ballast Point, San Diego in 8 fms. (Baker); La Jolla (Bristol); Carmen Island, Gulf of Calif. (Lowe); Laguna and White's Point (Lowe); Reef Pt. and White's Point (Strong); La Jolla, Calif. (W.K. Emerson).

Seila assimillata (C.B. Adams),1852. Gulf of California to Peru.
This species not of our fauna but considered by Mr. Strong.

Genus Metaxia Monterosato,1884. Type (by subsequent designation, Cossmann,1906), Cerithium rugulosum Sowerby.

" The shell is exceedingly slender, of many strongly convex whorls, sculptured with tuberculate spiral cords, the tubercles connected by axial threads. The base is truncate or concave between the periphery and the (con.)

insertion of the columella." (A.M. Strong).

Metaxia convexa (Carpenter),1856. San Pedro, Calif. (Baker) to Tres Marias Islands, Mexico. Type locality, Mazatlan, Mexico.

Mazatlan Catalogue, p. 444 (Dec. 1856). The description follows:

" Cerithiopsis testa gracili, albo-fusca, marginibus spirae rectis; anfr. x. normalibus, valde convexis, sutura profunda, eleganter cancellatis; costis spiralibus iv., super costas radiantes circiter xiii. undulantibus, ad intersectiones subnodosis; interstitiis quadratis, intus concavis; carina circa peripheriam haud tuberculosa; basi concava, sublaevi; apertura rotundata; labio distincto; haud prominente, rimam umbilicalem formente."
" This beautiful species is cancellated as in Phos; and is remarkable for the convexity of the whorls. The nuclear whorls are decollated. Long. 18, long. spif. 146, lat. .056, div. 12 . Habitat, Mazatlan."

Specimens in Fred Baker collection from San Pedro and from South Coronado Island dredged in 6 to 8 fms.

Figured by Baker, Hanna and Strong, Proc. Calif. Acad. Sci. ser. 4, vol. 23, 1938, p. 224, pl.18, fig.4.

" The shell is pale brownish or white. The spiral cords are four, of which the one at the summit is much the weakest while the tubercles on the other three are prominent and well rounded. Carpenter says of it " is remarkable for the convexity of the whorls." (A.M. Strong).

Metaxia diadema Bartsch,1907. Monterey, Calif. to Gulf of California. Reported at Point Abreojos by Eric Jordan and at Guadeloupe Island by Strong and Hanna. Type locality, San Pedro, Calif.

" Shell dark brown. Except for this much darker color and a somewhat larger size, whorl for whorl, there is little by which this species can be separated from Metaxia convexa (Carpenter)." (A.M. Strong).
(Bartsch described from two cotypes, one from Monterey and one from Ocean Beach near San Diego. He makes no mention of a type. He adds the following note " This species has been confounded with the European Metaxia metaxae, under which name it has appeared in many lists ...)".

Collecting data: dredged off Malaga Cove, Los Angeles Co. in 10 fms.; off Redondo Beach, Calif. in 25 fms. in gravel; (Burch); off South Coronado Island (F. Baker); San Hipolito Point (Hemphill); La Jolla (Bristol); San Diego in 5 fms. (Lowe); San Pedro and San Clemente Island (Lowe); rare at La Jolla (W.K. Emerson).

* Before leaving this family the following comments under the species Seila montereyensis Bartsch by Mr. A.M. Strong should be of interest.
" This species has been known from the west coast under the name of Cerithiopsis assimilata C.B. Adams, a Panamic species, which is pygmy in size compared with the present form." (Bartsch). " Except for the difference in size, whorl for whorl, there seems to be little by which the two species could be separated.

(Bartsch has identified specimens from the Gulf of California as Seila mexicana Bartsch, I can find no reference to this name and it is probably a ms. name. In general the Gulf of California specimens are intermediate in size between those from Panama and Southern California.

(C. kanoni and C. moreleti de Folin are probably synonyms of Seila assimilata. See Tryon, vol. 9, 174 for reference).

The following key and list of species are from Mr. A.M. Strong's note-book.

Key to Genera and Subgenera of Cerithiidae

Columella with an oblique median plication .... Clava
Columella without a plication
. Aperture with an anterior canal
.. Shell large, surface with wide spaced knobs or spines ..Cerithium
.. Shell small, surface with close spaced spiral ribs .... Potamides
... Shell turrited ....(Pirenella)
... Shell subcylindrical ....(Liocerithium)
. Aperture with a rudimentary anterior notch, lip thickened .Cerithidea
. Anterior portion of aperture more or less channeled, lip thin
.. Aperture irregular, distinctly channeled anteriorly....... Bittium
... Nuclear whorls with 2 spiral lirations
.... Sculpture showing varices ....(Bittium)
.... Sculpture regular, without varices ....(Lirobittium)
... Nuclear whorls smooth
.... Spiral sculpture predominating over axial .... (Stylidium)
.... Spiral sculpture not predominating over axial ....(Semibittium)
.. Aperture oval, feebly channeled anteriorly .... Alabina
.. Aperture greatly expanded at junction of outer and basal lip ... Diastoma.

Genus Clava Martyn, 1784	
Clava gemmatum (Hinds), 1844.	Magdalena Bay to Peru
Clava maculata Martyn	Galapagos Islands
Genus Cerithium Bruguiere, 1789.	
Cerithium maculosum Kiener, 1841.	Lower Calif. to Panama
Cerithium stercus-muscarum Val. 1833.	Cerros Island to Peru
Cerithium uncinatum (Gmelin), 1791.	Gulf of Calif. to Panama
Cerithium mediolaeve Carpenter, 1857.	Gulf of Calif. to Panama
Cerithium alboliratum Carpenter, 1857.	Gulf of Calif.
Cerithium adustum Kiener, 1841.	Panama to Ecuador
Cerithium billeheusti Petit	Ecuador and Galapagos
Cerithium nicaraguense Pilsbry & Lowe, 1932	Nicaragua
Genus Potamides Brongniart, 1810	
Subgenus Pirenella	
Potamides cyclus Dall, 1919	Laguna Beach to Gulf of Calif.
Potamides interruptum (Menke), 1850.	Pt. Sbreojos to Panama
Potamides galapaginus A. Adams	Gulf of Calif. to Galapagos
Potamides rissoinoides Carpenter (ms)	Gulf of Calif.
Subgenus Liocerithium	
Potamides sculptum Sowerby, 1855	Santa Barbara Island to Panama
Genus Pyrazus	
Pyrazus humboldti (Val.), 1833	Nicaragua to Panama
Genus Batillaria	
Batillaria filosa (Philippi), 1849.	Galapagos
Genus Cerithidea Swainson, 1840	
Cerithidea californica Haldeman, 1840.	Baulinas Bay to San Martin Island
Cerithidea albonodosa Carpenter, 1857	Gulf of California
Cerithidea fortiuscula (Bayle), 1880	Panama to Ecuador
Cerithidea montagnei d' Orbigny	Magdalena Bay to Panama
Cerithidea mutata Pilsbry & Vanatta	Galapagos

Genus Bittium Gray,1847

Bittium johnstonae Bartsch,1911	Laguna to Lower Calif.
Bittium panamensis Bartsch,1911	Panama

Subgenus Stylidium

Bittium eschrichtii montereyensis Bartsch,1907.	Monterey to Gulf of Calif.
Bittium attenuatum Carpenter,1864	Forrester Island to San Martin Id.
Bittium purpureum Carpenter,1864	Monterey to San Diego
Bittium subplanatum Bartsch,1911	Monterey to Coronado Island
Bittium serra Bartsch,1917	Monterey to San Bartolomo Bay
Bittium rugatum Carpenter,1866	San Pedro
Bittium armillatum Carpenter,1864	Santa Barbara to San Pedro
Bittium oldroydi Bartsch,1911	Destruction Island to Lower Calif.
Bittium quadrifilatum Carpenter,1864	Monterey to San Ignacio Lagoon
Bittium nitens Carpenter,1864	Gulf of Calif.
Bittium nicholsi Bartsch,1911	Gulf of Calif.
Bittium bartholomensis Bartsch,1917	San Bartolome Bay

Subgenus Lirobittium

Bittium interfossa Carpenter,1864	Monterey to San Diego
Bittium asperum lomaense Bartsch,1911	San Pedro to San Diego
Bittium catalinense Bartsch,1907	Catalina to San Diego
Bittium fetellum Bartsch,1911	Catalina
Bittium munitum munitoides Bartsch,1911	San Pedro to San Geronimo Island
Bittium larum Bartsch,1911	San Pedro to San Bartolomo Bay
Bittium cerralvoense Bartsch,1911	Gulf of Calif.
Bittium decussata Carpenter,1857	Mazatlan
Bittium mexicana Bartsch,1911	Gulf of Calif.
Bittium santamariensis Bartsch,1917	Santa Maria Bay
Bittium peruvianum d' Orbigny	Chile
Bittium sulciferum Troschel	Peru

Genus Alabina Dall,1902.

Alabina californica Dall & Bartsch,1901	San Pedro
Alabina tenuisculpta (Carpenter),1864	San Pedro to Magdalena Bay
Alabina occidentalis (Hemphill),1894	San Diego to Tres Marias Islands
Alabina phanea Bartsch,1911	San Diego
Alabina diegensis Bartsch,1911	San Pedro to San Bartolomo Bay
Alabina turrita (Carpenter),1866	San Diego
Alabina diomedae Bartsch,1911	Magdalena Bay to Gulf of Calif.
Alabina ignati Bartsch,1911	San Ignacio Lagoon
Alabina jordani Strong,1938	Guadalupe Island
Alabina crystalina (Carpenter),1864	Cape San Lucas
Alabina veraguaensis Strong & Hertlein	Bahia Honda, Panama

Genus Diastoma Deshayes,1861

Diastoma oldroydae Bartsch,1911	San Pedro
Diastoma stearnsi Bartsch,1911	San Diego
Diastoma fastigiata (Carpenter),1864	San Pedro
Diastoma sloveni Strong,1938	Guadalupe Island
Diastoma chrysalloides Bartsch,1911	Gulf of Calif.

Note- As a rule Mr. Strong does not list species confined to the range north of Point Conception.

Additions and Corrections

The following reports were received after typing the discussion in this issue.

Bursa californica (Hinds)- 12-60 fathoms in Monterey Bay, fairly common (A.G. Smith)

Argobuccinum vs. Fusitriton- " Hertlein thinks the latter appears to be applicable to oregonensis." This was out conclusion on page 5.

Fusitriton oregonensis (Redfield)- Woody Id.; Dutch Harbor; Unalaska Id.; Nash Harbor; Nunivak Island, Alaska (CAS); Vancouver Island (CAS); 15-60 fms. in Monterey Bay. (A.G. Smith).

Triphora montereyensis Bartsch- Monterey, in beach drift and dredged in 15 fms. (A.G. Smith).

Triphora pedroana Bartsch- Uncommon in sand at La Jolla, Ocean Beach etc. (W.K. Emerson).

Cerithiopsidae- Mr. Allyn G. Smith comments on this group " I have found an examination of the nucleus of specimens in this difficult group to be very helpful in identification, especially when a lot contains more than one species, as is not infrequently the case. Of course, when the nucleus is not present or badly eroded, the difficulty of identification is increased considerably."

Cerithiopsis- The following species are reported from Monterey Bay and vicinity-

berryi Bartsch- 5-30 fms.
columna Carpenter- Low tide and in 10 fms.
cosmia Bartsch- Beach drift
diegensis Bartsch- Low tide to 20 fathoms. (This record from Mr. A.G. Smith is an extension of the range as we had it on page 17- the range should then be from Monterey south to Arbolitos, L.C.
fia Bartsch- Shore to 25 fathoms
montereyensis Bartsch- Shore to 25 fms.
rowelli Bartsch- 25 fms. Also 25 fms., Carmel Bay. This is the only record we have received of this species.
santacruzana Bartsch- 3-30 fms. Range- Santa Cruz and Monterey Bay.
tumida (Bartsch)- shore

Cerithiopsis ingens (Bartsch), 1907. Proc. U.S.N.M. 33:180. Originally described as Bittium quadrifilatum ingens Bartsch, 1907. The description is in Oldroyd, 2-3-p 25. Type locality, " Albatross" Station 4475, ten miles off Pinos Light, Monterey, Calif. Mr. A.G. Smith advises that this is 58-85 fms. (USFC).

Mr. W.J. Eyerdam reports the following data on Cerithiopsis.

Cerithiopsis stejnegeri Dall, 1884. Iliuliuk Harbor, Unalaska, Aleutian Islands, 1932- 10 fms, mud- Coll. by W.J. Eyerdam.

Cerithiopsis stegnegeri dina Bartsch, 1911. Drier Bay, Knight Island, Pr. Wm. Sound, Alaska- dredged in 1923 by W.J. Eyerdam.

* Note* See our listing on page 15- this is an extension of range northward from Sitka, Alaska.

Cerithiopsis charlottensis Bartsch, 1917. Drier Bay, Knight Island, 1923 and Raspberry Island, Kodiak group, Alaska, 1945 on bread sponges.

Cerithiopsis onealensis Bartsch, 1921. Smith's Cove, Seattle, 1920- on drawn piling; Drier Bay, Knight Island, Alaska 1923- coll. by W.J. Eyerdam.

* Note*- This is a great extension of range northward from Puget Sound- see our listing on page 18 and change the range.

Cerithiopsis stephansae Bartsch, 1909, Shuyak Strait, Afognak Id., Alaska under stones on sponges- Eyerdam. * Note* Extension of range northward from Port Frederick, Alaska. See Page 19 and change.

Additions and Corrections (con.)

Cerithiopsis sassetta Dall,1919. We published the original description again on this species- page 20 this issue, and commented that it seemed to have b been left out by Oldroyd and others. We had received no information about it from anyone. However, Mr. Allyn G. Smith comments on it, and perhaps he has the reason for its general ommission. Mr. Smith says " We left Cerithiopsis sassetta Bartsch out of the Monterey list on the basis that it was the sameas Bittium serra Dall. I can't find the authority for this because of the lack of time at the moment. Maybe Strong knows where and when this change was made. I would very much like to check it."

Cerithiopsis willetti Bartsch,1921 and Cerithiopsis signa Bartsch,1921.

We were unable to place these species subgenerically. Mr. A. Smith comments " It is my impression that C. willetti and C. signa belonged to the section Cerithiopsina. Maybe you can check this."

We will appreciate knowing this as well as additional data on many of the others.

Seila montereyensis Bartsch- Low tide to 30 fms., Monterey Bay (A.Smith).

Metaxia diadema Bartsch- Monterey Baym shore to 30 fms.

Family Cerithiidae

In the first place we have the problem of the family name or names. Some recent authors have been using Potamididae. Bequaert, Jos. C. in Johnsonia #5 opens his paper with the statement " Cerithidea and Batillaria and the two western Atlantic genera of Potamididae". Thiele uses the family name Potamididae, as used by Bequaert, and Cerithiidae divided into two subfamilies, the first of which is Litiopinae which corresponds to the family we have been using, Litiopidae including the genera Alaba, Diala, and Litiopa. Thiele then places Barleeia under Rissoidae. His arrangement is quite different. Grant and Gale, of course, followed their custom of using the oldest genus resulting in Clavidae. It is scarcely fitting that we should attempt in such papers as these to discuss the findings in such papers as Dall, 1907 " On the Synonomic History of the Genera Clava Martyn, and Cerithium Bruguiere. However, in the light of Winckworth's recent paper in Proc. Mal. Soc. London it does seem that we must sooner or later decide whether or not to accept the Martyn generic names or reject them. In a letter (Per. Comm. Sept. '45) Dr . A. Myra Keen says " I believe we shall have to follow Winckworth in rejecting Martyn's names, I had hoped we might salvage the generic names on the ground that he was binary if not binomial, but evidently Winckworth opposes that course. Martyn's nomenclature certainly is inconsistent, and it may well be that we had best abandon him. However, I do regret to see Purpura go, as it means substituting that name for Thais ." Dr . Joshua L. Baily Jr. (Per. Comm. Sept. 1945) advises " It makes little difference whether you accept Clava or Cerithium. In either case you will have to give the reasons for each side in the question. Sooner or later the International Commission will have to rule on Martyn, and until then I shall continue to use Cerithium. Since neither of these is found in California you could dodge the issue by simply using Potamididae. This cannot be used as a substitute for the older name, but if the old family be divided into two the genus Potamides is available for type for one of them. I suspect that Potamides is probably as closely related to Melania as it is to typical Cerithium. But if you use Potamididae you had better check the spelling with some Greek scholar. I have seen it spelled Potamidae and I do not know which is correct"

In our Minutes # 16, October 1942 we published a three page paper " Notes on Cerithiidae" by A.M. Strong. We are not restating that discussion here. This paper was largely a consideration of some conclusions stated by J.C. Bequaert in Nautilus56:20,1942 " Random Notes on American Potamididae". Later in Nautilus 57:30 Bequaert published a note " Cerithidea Hegewischii (Philippi) a Pacific Coast Shell."

A key to west American genera and subgenera of the family Cerithiidae is found in Baker, Hanna and Strong " Proc. Calif. Acad. Sci. 4th Ser. vol. 23, no. 15, p. 224, 1938.

Genus Diastoma Deshayes,1850. (Atlas, Traité Elém. p. 46). Type (? by monotypy): D. costellata Deshayes (= Melania costellata Lamarck, fide Cossmann) (Above on advice of Dr. A.M. Keen).

" Shell turreted, whorls with numerous transverse ribs, and with a few intermediate varices. Inner margin of the aperture partially detached from the previous whorl; the aperture itself is strongly contracted posteriorly. " (Tryon).

The most important reference on this group is Bartsch, Paul Proc. U.S.N. M. no. 1802, vol.39, pp. 581-584, " The Recent and Fossil Mollusks of the Genus Diastoma from the West Coast of America" (4 text figures).

In this paper Dr. Bartsch explains a few terms used as follows:
" Axial sculpture", the markings which extend from the summit of the whorls toward the umbilicus.
The axial sculpture may be-
" Vertical", when the markings are in general parallelism with the axis of the shell.
" Protractive", when the markings slant forward from the preceding suture.
" Retractive", when the markings slant backward from the suture
" Spiral sculpture", the markings following the directions of the coils of the whorls.

Diastoma fastigiata (Carpenter),1864. This was described as Bittium by Carpenter from the Pleistocene of Santa Barbara, Calif. Figured in Oldroyd pl. 73, fig.1. Mr. A.M. Strong lists this as Recent from San Pedro, Calif. Miss Viola Bristol of the San Diego Museum reports that there are specimens in the collection there without collecting data.

Diastoma oldroydae Bartsch,1911. San Pedro, Calif.

Diastoma stearnsi Bartsch,1911. San Diego, Calif.

Genus Alabina Dall,1902. Type (by original designation), Bittium cerithidioidea Dall. Dall,1902, Nautilus, 15:11, p.127

" Shell small, slender, body whorl varicose. Nucleus slender, consisting of about three glassy smooth whorls enlarging less rapidly than the postnuclear whorls. Aperture subcircular. Basal lip extended and everted, producing a suggestion of a canal. Behind the inner lip lies a narrow umbilical groove. Sculpture consisting of narrow curved axial ribs and obscure spiral threads." (Woodring, 1928, Carnegie Inst. of Wash. p 338).

The most important reference on this group is Bartsch, Paul, Proc. U.S. N.M. no. 1790, vol. 39, pp 409-418, pls. 61-62, 1911, " The Recent and Fossil Mollusks of the Genus Alabina from the West Coast of America".

In this paper Dr. Bartsch published a key to species which we take the liberty of copying for the convenience of the members. See following page.

Key to the Genus Alabina (Bartsch)

Shell without sculpture .... turrita
Shell sculptured
. Shell without axial sculpture (except lines of growth)
.. Shell with a single spiral cord between the sutures.... occidentalis
.. Shell with five low, spiral cords between the sutures ..barbarensis
. Shell with axial sculpture
.. Axial ribs strong
... Spiral sculpture consisting of broad cords
.... Shell large; adult more than 6 mm. long .... hamlini
.... Shell small; adult less than 4 mm. long .... phanea
... Spiral sculpture not consisting of broad cords
.... Spiral sculpture consisting of slender cords
..... Shell slender, conic .... diomedae
..... Shell stout, broadly conic .... ignati
.... Spiral sculpture consisting of incised lines......... californica
.. Axial ribs slender or obsolete
... Axial ribs broad, but feebly developed
.... Spiral sculpture absent .... io
.... Spiral sculpture present ....t. phalacra
... Axial ribs slender
.... Adult shell less than 5.5 mm. long...................... monicensis
.... Adult shell more than 7 mm. long
..... Spiral sculpture obsolete between the sutures ..... tenuisculpta
..... Spiral sculpture strong between the sutures .... t. diegensis

Alabina californica (Dall and Bartsch) 1901. Described as Bittium from the Pleistocene of San Pedro, Calif.

Collecting data: If there are any Recent records of this species I have not heard of them. We have found it very common in the Pleistocene of Timm's Point and Hilltop Quarry, San Pedro but have never seen it living. (Burch) .

Alabina barbarensis Bartsch, 1911. Santa Barbara, Calif. Pleistocene

Alabina hamlini Bartsch, 1911. Los Angeles, Calif. Pleistocene

Alabina phanea Bartsch, 1911. San Diego, Calif.

Alabina io Bartsch, 1911. Signal Hill, Long Beach, Pleistocene

Alabina tenuisculpta (Carpenter), 1864. San Pedro, Calif. to Magdalena Bay. Type locality, San Diego, Calif.

Collecting data: Newport Bay, Calif. ; Estero, Ensenada, Mexico; Mission Bay; San Diego Bay (Burch); Mission Bay (Dr. F. Baker); San Diego Bay (Dr. Baker and Orcutt); San Pedro, Calif. (Lowe); Magdalena Bay, L.C. (Lowe) (San Diego Museum).

Alabina tenuisculpta phalacra Bartsch, 1911. San Diego, Calif.

Collecting data: Mission Bay, dredged by Dr. F. Baker.

Alabina diegensis Bartsch, 1911. San Pedro, Calif. to San Bartholome Bay, L.C. Type locality, San Pedro. Originally described as a variety of tenuisculpta.

Alabina calena Dall, 1919. Off San Luis Obispo Bay, Calif. in 252 fms.

Alabina turrita (Carpenter), 1866. San Pedro to San Diego. Type locality, San Pedro. Figured in Oldroyd and Bartsch.

Alabina occidentalis (Hemphill) 1894. San Diego, Calif. to Tres Marias Islands, Mexico. Type locality, San Diego, Calif. on mud flats.

Collecting data: Tres Marias Islands, Mex. (Baker Collection in San Diego Museum); Estero below Ensenada, Mexico (Burch).

There are several species listed above that seem to be known only from the fossil. We will appreciate knowing if there are any known Recent records of them. Otherwise they should be dropped from our final faunal list.

Genus *Bittium* ("Leach ") Gray, 1847. Gray, Oct. 1847, Ann. Mag. Nat. Hist. vol.20, p. 270. Type (by subsequent designation, Gray, Nov. 1847, Proc. Zool. Soc. London, p. 154)- *Murex reticulatus* Montagu (= *Strombiformis reticulatus* Da Costa). Recent European seas. Fide Woodring 1928.

" Shell small, very slender, spire high, body whorl small. Whorls varicose. Nucleus consisting of about four glassy smooth whorls. Aperture ovate, anterior canal broad, very stout, unemarginate. Sculpture consisting of axial ribs, overridden by spiral threads that are swollen on the axials." Woodring (Carnegie Inst. of Wash. 1928, p. 336).

Refer back to page 22 for Strong's key to genera and subgenera. The most important reference on this group is Bartsch, Paul " Proc. U.S.N.M. no. 1826, vol.40, pp. 383-414, pls. 51-58,1911 " The Recent and Fossil Mollusks of the Genus Bittium from the West Coast of America". Inasmuch as Dr. Bartsch has published in this paper the best key to species we have, and it is not available to all members we are taking the liberty of copying it.

Key to the Species of the Subgenera Semibittium, Lirobittium and Those of Uncertain Subgeneric Position. (Bartsch)

Spiral sculpture consisting of three strong cords between the sutures, between which intercalated slender cords may occur.
. Nodulose spiral keel at the summit less strong than the other two
.. Base with two very strong sublamellar keels .... *interfossa*
.. Base with slender spiral cords
... Peripheral cord exposed as a smooth band in suture .... *catalinense*
... Peripheral cord not apparent in the sutures ....*c. inornatum*
Nodulose spiral keel at the summit equal to the other two
. Axial ribs and spiral cords comparatively weak, always narrower than the squarish pits inclosed by them.
.. Junctions of axial ribs and spiral cords forming sharp cusps.
... Whorls with a strong shoulder .... *oldroydae*
... Whorls not shouldered .... *fetellum*
.. Junctions of axial ribs and spiral cords forming well-rounded tubercles.
... Shell large, unicolor, rusty-white (fossil)......... *armillatum*
... Shell small, wax-yellow, variegated with chestnut, usually with a broad chestnut, basal band.
.... Adult shell more than 6 mm. long .... *purpureum*
.... Adult shell less than 6 mm. long .... *decussatum*
. Axial ribs and spiral cords always strong and wider than the spaces inclosed by them.
.. Shell very large, with strong intercalated spiral cords .. *ornatissimum*
.. Shell smaller, without, or with very weak intercalated spiral cords only .
... Shell dark purplish-brown .... *vancouverense*
... Shell wax-yellow, banded with brown
.... Shell robust, with 25-30 axial ribs on its last whorl.. *munitum*
.... Shell smaller, with as many as 40 axial ribs on its last whorl... *m. munitoide*

Spiral sculpture, consisting of four strong cords between the sutures, between which intercalated slender cords may occur.
. Axial ribs becoming obsolete on the last whorls of the adult shell.
.. Summit of the whorls appressed.
... Intercalated spiral cords absent.
.... Shell slender, sculpture weak .... *attenuatum*
.... Shell robust, sculpture strong ....*a. boreale*
... Intercalated spiral cords present ....*a. multifilosum*
.. Summit of the whorls slopingly shouldered ....*a. latifilosum*

(con.)

. Axial ribs strong on all the whorls

.. Nodulose spiral cords at the summit less strong than the others.

... Spiral cords sloping gently anteriorly until fused with the body of the shell; posteriorly they are suddenly truncated.

.... Axial ribs on the last whorl 12-15

..... Shell of 10 post-nuclear whorls 8.1 mm. long .... asperum

..... Shell of 10 post nuclear whorls 7.1 long .... a. lomaense

.... Axial ribs on the last whorl about 25...............subplanatum

.. Nodulose spiral cords at the summit equal to the rest on ~~the last~~ whorl.

... Adult shell more than 17 mm. long.

.... Shell slender .... giganteum

.... Shell stout

..... Intercalated cords when present very feeble .... casmaliense

..... Intercalated cords always present, a t times more than one between the strong cords and almost equal to them in strength.. arnoldi

... Adult shell less than 13 mm. long.

.... Whorls decidedly overhanging

..... Base well rounded .... rugatum

..... Base flattened

...... Early post-nuclear whorls with 4 spiral cords .... larum

...... Early post-nuclear whorls with 2 spiral cords .... cerralvoense

.... Whorls not overhanging

..... Shell large; adult shell more than 11 mm. long ...... quadrifilatum

..... Shell small; adult shell less than 7 mm. long

...... Whorls shouldered at the summit .... nicholsi

...... Whorls appressed at the summit

.... Axial ribs on the last whorl 15 .... mexicanum

.... Axial ribs on last whorl 32 .... nitens

Subgenus Bittium s.s.

Bittium johnstonae Bartsch,1911. Laguna Beach, Calif. to Lower Calif. Type locality, Lower Calif.

Subgenus Stylidium Dall,1907. Type (by original designation), Bittium eschrichtii (Middendorff).

Bittium eschrichtii (Middendorff),1849. Craig and Drier Bay, Alaska south to Crescent City, Calif. Type locality, Sitka, Alaska.

Collecting data: The situation in my experience with this species has been to find the northern specimens heavier and coarser. Dr. Bartsch in his description of the variety montereyense states that it differs by being less strongly keeled, much more smooth, more slender etc. There is no doubt but that the southern specimens do fit the description and are perhaps properly given a subspecific name. However, the place to divide them is the problem. The above range as given by Dall gives the extreme southern range as Puget Sound. I can see no difference between specimens collected at such places as De Poe Bay, Oregon and even Crescent City, Calif. and those from the far north. Those from Monterey do seem to be quite different. (Burch). W.J. Eyerdam reports an extension of range northward as indicated by the range stated above. Eyerdam reports the species from Craig, Pr. of Wales Island, and Drier Bay, Knight Island, Alaska. He also reports the species common in Puget Sound. Other records- Orcas Island, Puget Sound in 10 to 30 fms. (Dr. F. Baker); Cape Foulweather, Ore. (Orcutt); Tacoma, Wash. (Lowe) (San Diego Museum).

Bittium eschrichtii montereyense Bartsch, 1911. Crescent City, Calif. to Cape San Lucas, L.C. Type locality not stated in description by Bartsch.

Collecting data: Abundant on algae at low tides Monterey, San Simeon, Cayucos (Burch); Crescent City, Calif. (Chace); Pacific Grove (Chaney); Cayucos (Caruthers and Strong); Monterey (Lowe).

Bittium eschrichtii icelum Bartsch, 1911. Fuca Strait to Monterey, Calif. Type locality, Neah Bay, Wash.

Dr. Bartsch states that this variety shows axial ribs on all turns. I have never identified such a specimen and neither has any of the other members. (Burch).

Bittium paganicum Dall, 1919. Off Monterey Bay, Calif. in 356 fathoms.

Subgenus Semibittium Cossmann, 1896. Type, Cerithium cancellatum Lamarck. " Spiral sculpture not predominating over the axial."

Bittium vancouverense Dall and Bartsch, 1910. Drier Bay, Alaska (Eyerdam) south to Vancouver Island, B.C. Type locality, Barkley Sound, Vancouver Island, B.C.

Collecting data: Drier Bay, Knight Island, and Raspberry Island, Alaska (W.J. Eyerdam); Ketchikan, Alaska (G. Willett); Vancouver Island (Lowe); Bear Bay, Peril Straits, Alaska (Lowe) (San Diego Museum).

Bittium attenuatum Carpenter, 1864. Forrester Island, Alaska to San Martin L.C. (Baker) and San Geronimo Island (Lowe).
Type locality, Monterey, Calif.

Collecting data; Monterey, Calif. littoral in algae and dredged in 10 fathoms on the shale off Del Monte; dredged off Avalon, Catalina Island in 35 fms.; Pleistocene from Timm's Point, Hilltop Quarry and Knobb Hill, San Pedro (Burch); South Island, Los Coronados in 3 to 7 fms. (Dr. F. Baker); San Martin Island, L.C. (Dr. Baker); San Geronimo Island, L.C. (Lowe); San Benito Island, L.C. (Lowe); Laguna Beach and Newport Beach, Calif. (Lowe); Catalina Island (Oldroyd); San Pedro (White) (San Diego Mus.

Bittium attenuatum boreale Bartsch, 1911. Gravina Island near Ketchikan, Alaska (Boucher) to Vancouver Island, B.C. Type locality, Barkley Sound, Vancouver Island, B.C.

The northern extension of range was reported to us by Dr. A. Myra Keen " by V.J. Boucher (specimen in Stanford collection).

Bittium attenuatum multifilosum Bartsch, 1907. Monterey to San Martin Island, L.C. (Dr. F. Baker). Type locality, White's Point, Los Angeles Co., Calif.

Collecting data: San Martin Island, L.C. (Dr. Fred Baker); San Pedro (Oldroyd) (San Diego Museum)

Bittium attenuatum latifilosum Bartsch, 1911. Terminal Island, Calif. to San Martin Island, L.C. (Dr. F. Baker). Type locality, Terminal Island.

Collecting data: San Martin Island, L.C. and San Diego, Calif. (Dr. Baker

Bittium subplanatum Bartsch, 1911. Monterey south to Coronado Island, L.C. Type locality, Catalina Island, Calif.

Collecting data: This is as good a place as any to suggest that the subgeneric divisions of Bittium work much better on paper than they do in actual practice. Typical specimens of B. subplanatum are so amazingly common in spots off Redondo Beach particularly in mud bottom and between 100

(con.)

and 150 fms., that in dredging we would simply spread the countless thousands of Bittium out on the table and pick out other small forms from the Bittium. We also dredged them in as shallow as 50 fathoms and off Catalina Island in 35 fathoms.

However, the interesting feature of these large lot of specimens (of which we will gladly s end a large lot to any student wishing to make a detailed study) is that with them we find large numbers of typical Bittium catalinense Bartsch in the Catalina Island material although even the B. catalinense seem to vary off Redondo Beach in the deeper dredgings by becoming longer and narrower than the Catalina Island specimens.

Mr. George Willett always insisted that they are two good distinct species but I could never see it because, in sorting, the intergrades were common in every degree. So clear was this intergradation that I mailed a lot to Dr. Paul Bartsch with no comments and he wrote that we seemed to have intergraded subplanatum and catalinense. And the meaning of this is also obvious since this means intergrading specimens of the subgenus Semibittium with specimens of Lirobittium. I have found the subgenera of very little aid in actual work. (Burch),

Reported from San Pedro (Dr. F. Baker).

Bittium rugatum Carpenter,1866 . San Pedro and Catalina Island (Dall). to Todos Santos Bay, L.C. (Eric Jordan).

Type locality, Lower Pleistocene of Santa Barbara, Calif.

Collecting data: South end of San Clemente Island (Dr. F. Baker); La Jolla (Bristol); San Diego (Orcutt) (San Diego Museum).

I have never taken a Recent specimen of this quite distinctive species although I have it in any number from the Pleistocene of Hilltop Quarry and Timm's Point of San Pedro , and from the Del Rey, Baldwin Hills deposit although rare there. (Burch).

Bittium quadrifilatum Carpenter, 1864. Monterey, Calif. to San Ignacio Lagoon, L.C. Type locality, San Diego, Calif.

Collecting data: In our experience this is one of the most common of littoral species of this genus. It is certainly confined to very shallow water as we have never dredged it other than close to shore or once inside Newport Bay in shallow water. We have it from Monterey, Calif. in algae; Mission Bay; Bird Rock and Point Loma, San Diego Co.; Malaga Cove, L.A. Co.; San Onofre; Ocean Beach etc. (Burch); San Ignacio Lagoon, L.C. (Lowe); La Jolla (Bristol); Point Loma in 30 fms. (Baker); San Diego (Baker, Hemphill and Stephens) (San Diego Museum); Mission Beach (Roy L. Morrisson) " very common in eel grass patches in Mission Bay" (W.K. Emerson).

The subspecies B. q. ingens Bartsch,1907 was covered under Cerithiopsis.

Bittium armillatum Carpenter,1864. Santa Barbara and San Pedro, Calif. south to San Martin Island, L.C. (Baker). Type locality, Lower Pleistocene of Santa Barbara, Calif.

Collecting data: Living from San Pedro Bay; Pleistocene of Hilltop Quarry (Burch); Todos Santos Bay, L.C. (Orcutt).

Bittium purpureum (Carpenter),1864. Monterey to San Martin Island,L.C. (Baker). Type Locality, Monterey and Santa Barbara, Calif.

Collecting data: Dredged off Redondo Beach in 25 fms., gravel; off Avalon, Catalina Island in 35 fms.; Pleistocene of Hilltop Quarry (Burch); rare in kelp holdfasts at Mission Beach (W.K. Emerson); San Martin Island, L.C. (Baker); San Diego (Baker); San Pedro (Strong and White); Portuguese Bend, Los Angeles Co. (Lowe).

Bittium challisae Bartsch,1917. San Juan Island, Gulf of Georgia.

Bittium sanjuanense Bartsch,1917. San Juan Island, Gulf of Georgia.
Collecting data: Specimens dredged off San Juan Islands by Trevor Kincaid Olga, Wash. (Engberg).

Bittium serra Bartsch,1917. Off Point Pinos to San Diego, Calif. in 75 fms and San Bartholome Bay, Lower Calif.
Type locality, off Point Loma Light, Calif. in 71-75 fathoms.

Subgenus Lirobittium Bartsch,1911. Type (by original designation), Bittium catalinense Bartsch,1907.

Bittium interfossa Carpenter,1864. Monterey to San Martin Island, L.C. (Baker Type locality, Monterey, Calif.

Collecting data: Malaga Cove, L.A. Co.; Dana Point and San Onofre, Orange Co.; Portuguese Bend, Los Angeles Co.- all littoral (Burch). We have specimens from deep water differing slightly and labelled cf. interfossa. I do not know what they are. (Burch); rare in Mission Bay (W.K. Emerson); San Martin Island, L.C. (Baker); So. Coronado Island in 14 fms. (Baker); Ocean Beach (Baker); San Diego (Hemphill); La Jolla (Chaney and Bristol); San Pedro (Lowe) (San Diego Museum).

Bittium catalinense Bartsch,1907. Catalina Island to San Martin Island, L. C (Baker). Type locality, Pleistocene at Santa Barbara, Calif.

Collecting data: This species was discussed above under subplanatum. It is possible that we have a subspecies of catalinense in those deepwater longer and narrower specimens, but it is my opinion that this species runs right into subplanatum and perhaps others. Abundant in from 75 to 200 fms. off Redondo Beach and Catalina Island. Not uncommon in the Pleistocene of Hilltop Quarry and Timm's Point of San Pedro (Burch); San Martin Id. L.C. (Baker); Catalina Island in 40 fms. (Strong); Catalina Island in 35 fms. (Lowe).

Bittium catalinense inornatum Bartsch,1911. Catalina Island to San Diego, Calif. Type locality, Catalina Island, Calif.

Collecting data: The described " spiral keel" in the suture ranges from none to sharp in my experience. When you think you have inornatum put it under a stronger glass and you may note indications of a keel. I have never been able to label a specimen with this name. (Burch).

Bittium ornatissimum Bartsch,1911. San Pedro, Calif. Pleistocene. Santa Barbara, Calif. Type locality, Deadman Island, San Pedro (fossil).

Dr. W.P. Woodring comments on this species (Per. Comm. Sept. 1945) " I agree with you that the abundant Pleistocene species of Bittium in the San Pedro district are rugatum and armillatum. I think ornatissimum is a synonym of armillatum."

Whether or not ornatissimum is a synonym of armillatum I have heard of no one claiming to have Recent specimens. Therefore we propose to drop it from our faunal list unless further advised.

Bittium munitum Carpenter, 1864. Forrester Island, Alaska (G. Willett) south to Cambria Pines, Calif. (Burch). Type locality, Neah Bay, Wash.

Collecting data: Forrester Island, Alaska (Willett); Cambria Pines, Calif. (Burch).

Bittium munitum munitoide Bartsch,1911. San Pedro, Calif. to San Geronimo Island, (Lowe). Reported from San Pedro (Oldroyd).

Bittium asperum Gabb,1861. Redondo Beach, Calif. (Burch) south to Ballenas Bay (Eric Jordan). Type locality: Post-Pliocene marl, Santa Barbara, on advice of Dr. A.M. Keen. Dr. W.P. Woodring states (Per. Comm. Sept. 1945) " The type locality of B. asperum is Santa Barbara, Pleistocene (of my terminology, Pliocene of others; Gabb called it Miocene.)"

Collecting data: Dredged off Redondo Beach in 50 fms.; off Malaga Cove in 15 fms.; Pleistocene of Hilltop Quarry (Burch);

* Note* Mrs. Oldroyd seems not to have copied the original description of Bittium asperum. I have no copy of Gabb. When we get it we will run it for the convenience of members.

Bittium asperum lomaense Bartsch,1911. Catalina Island to San Benito Island (Lowe). Type locality, 71-75 fathoms off Point Loma Light, San Diego.

Collecting data: San Benito Island in 10 fms. (Lowe); Catalina Island in 50 fms. (Lowe); South Coronado Island and San Diego (Baker) (San Diego Museum).

Bittium larum Bartsch,1911. Santa Monica, Calif. (Burch) south to San Battholome Bay, L.C. Type locality, San Pedro, Calif.

Collecting data: An easily recognized species dredged common off Santa Monica, Redondo Beach, and San Pedro, Calif. in from 25 to 50 fathoms. It is usually associated with gravel or rocks. Dredged off Ensenada, Mex. in Todos Santos Bay in 50 fms.; Pleistocene of Hilltop Quarry, San Pedro (Burch);

Insertae Sedis

Bittium oldroydae Bartsch,1911. Destruction Island, Washington to Lower Calif. Type locality, Lower Calif. in drift.

This species is usually spelled oldroydi. Dr. A.M. Keen advises " B. oldroydi should be emended to Bittium oldroydae , as it was named for Mrs. Oldroyd."

Collecting data: San Diego (Kelsey); San Pedro (Lowe).

Bittium fetellum Bartsch,1911. Off Catalina Island in 16 fathoms.

Bittium giganteum Bartsch,1911. Pleistocene of San Pedro and San Diego, Calif.

If there are any Recent records of this species we would like to hear of them. Our opinion at this time is that this is found only fossil.

Bittium tumidum Bartsch,1907. Monterey to San Pedro (Oldroyd). Type locality, Monterey.

None of the members reported on this species. I do not know it. It was omitted from Dall. 112 and also from Keen's " Abridged Check List".

Genus Potamides Brongniart,1810. Type (by monotypy), P. lamarckii Brongniart. Fide Pilsbry.

" Shell turriculated, whorls angulated and coronated; aperture prolonged in front into a nearly straight canal; outer lip thin, sinuous; epidermis thick, olive brown. Operculum many-whorled." (Tryon).

Subgenus Pirenella Gray,1847. Type (by original designation), Cerithium mammillatum Philippi.

Potamides cyclus Dall,1919. Long Beach, Calif. to Gulf of Calif. Type locality, Laguna Beach, Calif.

(con.)

Dr. A. Myra Keen calls attention to a problem in connection with this species. Vertagus lordii Yates, Santa Barbara Soc. Nat. Hist. Bull. no.2, p.47,pl.2,figs.6,7, August,1890. Grant and Gale, p. 758 make the following statement " Clava ? lordii (Yates) , a form described from a single beach worn specimen retainibg only the body whorl and part of the penultimate whorl, appears as figured to be somewhat like C. gemmata; but it has more numerous rows of nodules. It came from the Santa Barbara Channel near Ellwood Santa Barbara Co. It may have been a ballast shell or a fossil washed out on the beach. Potamides cyclus Dall may be a synonym of lordii." Dr. Keen comments on this as follows " Yates also described a Vertagus lordii ; one would have to see the holotype to make sure what this latter is, but I suspect Grant and Gale are correct. They also suggest (p. 758) that Potamides cyclus Dall is a synonym of Yate's species; I had come to the same conclusion before noticing their comment."

Subgenus Liocerithium Tryon,1887. Type (by monotypy) Cerithium incisum Sowerby = C. sculptum Sowerby.

Potamides sculptum Sowerby,1855. Santa Barbara Islands, Calif. to Panama and the Galapagos Islands. Type locality is unknown.

Genus Cerithidea Swainson,1840. Type (by designation of Pilsbry and Harbison,1933,), Melania lineolata Griffith and Pidgeon,1834 (not Strombus lineolatus Gray,1828) = Cerithium obtusum Lamarck,1822. Fide Bequaert, Johnsonia, no.5, p. 1.

" Shell turriculate, often decollate, with many convex whorls, strongly sculptured. Vertical ribs regularly spaced, either even or more or less cut into tubercles and stopping at the periphery of the body whorl:; in addition, weak vertical growth striae and, in the intervals between the ribs, fine spiral striae; base, below the periphery, often with coarse spiral grooves and ridges, cut by fine growth-striae. Aperture with the columellar margin nearly straight, ending below in a slightly produced, very shallow groove; lower half of outer lip somewhat projecting beyond the base of the columella; edge of outer lip thickened, particularly over the upper two thirds, smooth inside. In some cases the thickened lip is repeated several times during life, older shells showing a series of varices along the spire. Operculum corneous, subcircular, spiral, closely coiled about a central nucleus. Animal with an anterior snout and a subcircular foot, obtuse behind; eyes on the tentacles, some distance from the tips; siphon long or short, usually fringed." (Bequaert, Johnsonia 5)

south to Tepoca Bay(Lowe)

Cerithidea californica (Haldeman),1840. Baulinas Bay, Calif. south to San Ignacio Lagoon (Eric Jordan). Type locality,'California in brackish water' on advice of Dr. A.M. Keen. Dr. Joshua L. Baily Jr. writes "According to the late Judge Junius Henderson, the type locality of Cerithidea californica is the Gulf of California, which would put it far outside of the range you have given."

Collecting data: Perhaps the most abundant species in the entire faunal list, appearing in vast numbers on almost all mud flats along the southern California coast. (Burch). San Quintin Bay, San Martin Island, Tepoca Bay, Sonora (Lowe) ; Tom ales Bay, Marin Co., Calif. (Abbott). T

The set in the Lowe Collection in the San Diego Museum from Tepoca Bay, Sonora takes the range into the Gulf of California.

Cerithidea californica hyporhyssa (Berry),1906. Nautilus, vol.19,p.132. Type locality, San Diego.

This variety is generally ignored and placed in the syhonymy. However,

(con.)

it is a smooth form and I have collected several thousands of them from San Diego Bayand they seem to be at least a different race of the species. I have never seen the same thing from any other locality, and am personally disposed to think it may be worthy of the subspecific name. However, I think that other members of the club have advised me that they have taken the smooth form elsewhere. But in any event they are definitely not worn smooth. They are simply different. We have been discussing distinct species that differ less from others than this does in my opinion. (Burch).
San Diego Bay- south of Coronado and south of National City (Junius Henderson (San Diego Museum).

Family Trichotropidae

Genus Trichotropis Broderip and Sowerby,1829. Type (by subsequent designation Hermannsenn,1849), Turbo bicarinata Sowerby.

" The shell may be characterized as being turbinated, and carinated externally; its aperture is wide, but still longitudinal, and it is rather longer than the spire; its base is entire, without any notch, although immediately below the obliquely truncated base of the columella there is an indistinct canal. The whole shell is thin and delicate, its outer lip particularly so. Epidermis horny, forming numerous sharp-pointed bristle-like processes on the edges of the carinae outside the shell; very strong and by its contraction in drying frequently breaking the edge of the lip. Operculum horny, much smaller than the aperture, composed of elliptical laminae its apex or nucleus lateral." (Sowerby).

Dr. Joshua L. Baily Jr. comments on this family (Per. Comm.) " I notice that Tryon, in the Manual of Conchology, places Trichotropis between the Janthinidae and the Scalaridae, while Cooke, in the Cambridge Natural History, places it between the Lamellariidae and the Naticidae. I wonder why."

Subgenus Trichotropis s.s.

Trichotropis bicarinata (Sowerby),1825. Shantar Islands, and on the east to Nunivak Island, Bering Sea. (Dall). Type locality, Newfoundland.

Collecting data: Punuk Island, Bering Sea in 15 fms. (Lewis)(Willett).

Trichotropis conica Moller,1842, Forrester Island, Alaska; also Greenland. Type locality, Greenland.

Trichotropis borealis (Sowerby),1829. (T. costellata Couthouy,1838) in syn. The original description of this species is not in Oldroyd. Dr. A. Myra Keen has sent us the following data:

T. borealis: Type loc.: Northern Ocean, near Melville Island.
Original description (Zool. Journal, vol.4, p. 375) " T. testa suboblonga anfractibus quatuor rotundatis, subcancellatis, ultimo carinis tribus vel quatuor setosis; long. 1/10, lat. 11/20 poll." " Shell of a rather oblong form, with from 3 to 4 volutions, which are somewhat rounded, but furnished with 3 or 4 not very prominent, obtuse, keels, with smaller intervening striae, which are decussated by the lines of growth. The columella and the canal immediately below it are rather more lengthened than in the last species; the umbilicus is also rather more expanded, and consequently not so linear as in T. bicarinata ; on its edge as well as on the keels of the outside of the shell, the epidermis is produced into numerous bristle-like appendages.."

Range:- 54-72. Arctic Seas, Bering Sea, the Aleutian Islands and south to the Queen Charlotte Islands, British Columbia; (Dall).

Collecting data: Cape Lisbourne, Arctic Ocean in 30 fms.; Frederick Sound in 15 fms.; Montague Island, Pr. Wm. Sound in 18 fms.; Galena Bay, Pr. Wm. Sound in 15 fms.; (Lewis) (Willett)- have a set labelled costellata from 12 fms. off Hinchinbrook Island, Alaska collected by I. Norberg (Eyerdam)

Trichotropis cancellata (Hinds), 1843. Southern part of Bering Sea, and south to Oregon. Type locality, deep water Massachusetts Bay.

Collecting data: Montagu Island, Pr. Wm. Sound in 18 fms.; Humpback B. near Wrangell in 15 fms.; Vjenite Pass in 6-10 fms. ; Victoria, B.C. (Lewis) (Willett); dredged in Puget Sound off Friday Harbor (T. Kincaid); Orcas Island, Puget Sound (Dr. Baker); Port Blakeley, P.S. (Lowe)(San Diego Mus.)

Trichotropis insignis Middendorff, 1849. From Bering Strait south, on the west to Northern Japan, and on the east to the Aleutian Islands and Cooks Inlet, Alaska. (Dall). Type locality, Bering Sea.

Collecting data: Punuk Island, Bering Sea in 15 fms.; Terror Bay, Kodiak Island (Lewis) (Willett); Dutch Harbor, Aleutians (W.J. Eyerdam); Drier Bay, Knight Island (Eyerdam); Kodiak, Alaska (Lowe).

Subgenus Iphinoe H. & A. Adams, 1854. Type (by subsequent desig. Cossmann, 1906), Trichotropis unicarinata Sowerby.

" Shell thin; aperture subtrigonal; axis widely and deeply perforated."

Trichotropis coronata Gould, 1860. Arctic Ocean and Bering Sea. Type locality, Straits of Semiavine, Arctic Ocean in 20 fathoms.

Collecting data: Cape Lisbourne, Arctic Ocean in 30 fms. (Lewis)(Willett

Trichotropis kroyeri Philippi, 1848. Arctic and Bering Seas, eastward to Shumagin Islands. Type locality, ? Spitzbergen.

Trichotropis kelseyi Dall, 1905. Off San Diego, Calif. and Point San Quentin L.C. Type locality, off San Diego in 359 fathoms.

Subgenus Provana Dall, 1918. Type (by monotypy); T. (P.) lomana. Subgenus not otherwise diagnosed. (Advice of Dr. A.M. Keen).

Trichotropis lomana Dall, 1918. Off Point Loma, San Diego Co., Calif. in 650 fathoms.

Family Caecidae

The following keys and list of species are from Mr. A.M. Strong's note-book. We will then take up a detailed discussion of the species reported north of San Diego.

Family Caecidae

Sculpture faint or absent .... Fartulum
Sculpture present
. With raised longitudinal ridges or angulations only.... Elephantulum
. Sculpture not confined to longitudinal ribs
.. With circular rings, longitudinal sculpture absent
... Rings strong and distantly spaces, less than 3.5 mm. long.. Caecum
... Rings slender and closely spaced, more than 3.5 mm long .. Micranellum
.. With both longitudinal ribs and raised rings ....Elephantanellum

Surface smooth or with microscopic striae only ....Fartulum
Surface sculptured with fine raised rings only .... Micranellum
Surface sculptured with strong raised rings only .... Caecum
Surface with longitudinal ridges or sharp angles only.... Elephantulum
Surface with longitudinal ridges and raised rings .... Elephantanellum

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Genus Fartulum

Surface entirely smooth
. Plug with a triangular point or lateral spur
.. Plug pointed toward concave side of tube.. Mazatlan..... reversum Carp.
.. Plug pointed toward convex side of tube
... Tube nearly straight
.... Tube light brown or white San Pedro to Pt. Abreojos ...hemphilli Bartsch
.... Tube dark brown, smaller San Pedro to Lower Calif. ... bakeri Bartsch
... Tube strongly curved Mazatlan-Panama .... laeve C.B. Adams
.. Plug rounded or with a rounded knob
... Plug hemispherical
.... Tube stout, less than 2 mm. in length Mazatlan .... glabriforme Carp.
.... Tube slender, more than 3 mm. in length San Pedro to Lower Calif...
.. occidentale Bartsch
... Plug not hemispherical
.... Aperture somewhat angulated Mazatlan ....teres Carpenter
.... Aperture not angulated
..... Aperture oval San Pedro to Lower Calif. .... orcutti Dall
..... Aperture circular Mazatlan ....dextroversum Carp.
Surface not entirely smooth
. Surface with microscopic concentric wrinkles Mazatlan .. corrugulatum Cpr.
. With a few faint rings near the aperture Mazatlan .... farcimen Carp.

Genus Fartulum

Surface smooth except for microscopic lines of growth
. Section slightly laterally compressed, aperture contracted
2.1 x 0.7 mm. San Pedro to Lower Calif. .... orcutti
Wash. Ac. 10-566; Oldroyd 2-2-47
. Section subangulated, aperture contracted, then reflexed
2.9 x 0.7 mm Mazatlan .... teres
Mazatlan Catalogue no. 378
. Section circular
.. Plug hemispherical, without a claw
... Shell large for the genus
3.1 x 0.9 mm. San Pedro to Lower Calif. .... occidentale
Wash. Ac. 10-566
... Shell much smaller
1.8 x 0.4 mm. Mazatlan .... glabriforme
Mazatlan Catalogue no. 374
.. Plug triangular or with a lateral spur
... Tube nearly straight
.... Light brown to white
3.i x 0.7 mm. San Pedro to Lower Calif. .... hemphilli
Wash. Ac. 10-566
.... Dark Brown, smaller
2.5 x 0.6 mm. San Pedro to Lower Calif. .... bakeri
Wash. Ac. 10-566
... Tube strongly curved
.... Horn colored, sometimes with brown marks
1.5 x 0.5 mm. Mazatlan- Panama .... laeve
Mazatlan Catalogue no. 372
.. Plug with a central raised knob
... Tube tapering
2.6 x 0.6mm. Mazatlan .... dextroversum
Mazatlan Catalogue no. 376
.. Plug with the point at the front
1.2 x 0.3 (young) Mazatlan .... reversum
Mazatlan Catalogue no. 377

Surface with microscopic concentric wrinkles
1.9 x 0.4 mm. Mazatlan .... *corrugulatum*
Mazatlan Catalogue no. 375
Surface with a few faint rings near the aperture
1.6 x 0.5 mm. Mazatlan .... *farcimen*
Mazatlan Cat. no. 373

Genus *Micranellum*
Plug with an attenuated , oblique spur
. Anterior portion of adult shell bulbously expanded
.. Rings about 75 on adult segment
... Shell robust
4.5 x 1.3 mm. off Santa Rosa and Catalina Islands .... *catalinense*
Jr. Wash. Acad. Sci. 10:568
... Shell slender
5.5 x 1.3 mm. off San Diego .... *profundicolum*
Jr. Wash. Acad. Sci. 10:568
.. Rings about 100 on adult segment
5.3 x 1.5 mm. San Pedro to San Diego............ *pedroense*
Jr. Wash. Acad. Sci. 10:569
.. Rings very numerous
2.9 x 0.4 mm. Mazatlan .... *subimpressum*
Mazatlan Cat. no. 367
. Anterior portion of adult shell not bulbously expanded
.. Shell robust
... 6.2 x 1.6 mm. Barkley Sound .... *barkleyense*
Jr. Wash. Acas. Sci. 10:568
.. Shell slender
4.6 x 1.2 mm. Forrester Island to Monterey .... *oregonense*
Jr. Wash. Acad. Sci. 10:568
Plug with a spreading base and triangular point
. Rings comparatively distant
6.9 x 1.2 mm. Off Santa Rosa Island .... *rosanum*
Jr. Wash. Acad. Sci. 10:568
. Rings fine and close
6.2 x 1.3 mm. Monterey to Lower Calif. .... *crebricinctum*
. 50 low rings lohri S. & H.
. Rings rounded scarcely rising
2.8 x 0.6 mm. Mazatlan .... *elongatum*
Mazatlan Catalogue no. 366

Genus *Caecum*
Shell robust
. About 40 strong rings on adult segment
2.8 x 0.8 mm. Monterey to Lower California .... *californicum*
. About 30 flattened, squarish rings
2.5 x 0.6 mm. Mazatlan-Panama .... *firmatum*
. About 20 rings with wide interspaces
2.3 x 0.7 mm. off San Diego .... *grippi*
Jr. Wash. Ac. Sci. vol. 10:566
. About 15 rings with narrow interspaces
2.5 x 0.7 mm. San Diego to Lower California .... *dalli*
Jr. Wash. Acad. Sci. 10:568
. Very distant, bar-like, sharp rings
2.55 x 0.75 mm. Mazatlan .... *clathratum*
Maz. Cat. no. 369

(con.)

Shell slender

- About 20 narrow, slender rings
  2.0 x 0.4 mm San Diego .... diegensis
- About 18 broad rings
  2.2 x 0.5 mm Monterey to San Diego .... licalum
- About 15 rings on adult segment, young segments smooth
  1.85 x 0.5 mm Mazatlan-Panama .... parvum C.B. Adams

Genus Elephantulum

About 20 ridges separated by shallow grooves
2.75 x 0.7 mm. Panama .... laqueatum
Panama Shells no. 215

Ridges strong, squarish, separated by deep grooves
3.3 x 0.7 mm. Mazatlan .... insculptum
Maz. Cat. no. 360

Sculpture of fine ridges and striae

- Plug rounded, with an obtuse point
  3.3 x 0.65 mm. Mazatlan .... obtusum
  Maz. Cat. no. 363
- Plug flat, with a small subspiral knob
  3.9 x 0.75 mm. Mazatlan .... subspirale
  Maz. Cat. no. 361

Genus Elephantanellum

About 7 strong, angular ridges crossed by strong rings
? x 0.4 mm. Mazatlan .... heptagonum
Maz. Cat. no. 365

Ribs variable but riding over the fine rings
3.5 x 0.8 mm. Mazatlan .... liratocinctum
Maz. Cat. no. 364

About 30 fine ridges, rings fine except terminal one
1.5 x 0.6 mm. Mazatlan .... abnormale
Maz. Cat. no. 362

Ridges fine, rings strong near the aperture
4.8 x 0.9 mm. San Pedro to Lower Calif. .... carpenteri
Jr. Wash. Ac. Sci. 10:567

Genus Fartulum

Fartulum orcutti Dall	San Pedro to Mazatlan
Fartulum occidentale Bartsch	Puget Sound to Lower Calif.
Fartulum hemphilli Bartsch	San Pedro tp Point Abreojos
Fartulum bakeri Bartsch	Alaska to Gulf of Calif.
Fartulum teres Carpenter	Mazatlan
Fartulum glabriforme Carpenter	Mazatlan
Fartulum dextroversum Carpenter	Mazatlan
Fartulum reversum Carpenter	Mazatlan
Fartulum corrugulatum Carpenter	Mazatlan
Fartulum farcimen Carpenter	Mazatlan
Fartulum laeve C.B. Adams	Mazatlan to Panama

Genus Caecum Fleming, 1817.

Caecum bahiahondaense Strong & Hertlein	Bahia Honda, Panama
Caecum californicum Dall	Monterey to Lower Calif.
Caecum clathratum Carpenter	Mazatlan to Panama
Caecum dalli Bartsch	San Pedro to Lower Calif.
Caecum diegensis Bartsch	San Diego

(con.)

Caecum firmatum C.B. Adams	Mazatlan to Panama
Caecum grippi Bartsch	San Diego
Caecum licalum Bartsch	Monterey to San Diego
Caecum parvum C.B. Adams	Mazatlan to Panama
Caecum richthofeni Strong & Hertlein	Taboga Island, Panama

Genus Micranellum Bartsch,1920

Micranellum catalinense Bartsch	Santa Rosa and Catalina Island
Micranellum crebricinctum Carpenter	Monterey to San Martin Island
Micranellum lohri Strong and Hertlein	Taboga Island, Panama
Micranellum elongatum Carpenter	Mazatlan
Micranellum pedroensis Bartsch	San Pedro to Panama
Micranellum profundicolum Bartsch	San Diego
Micranellum rosenus Bartsch	Santa Rosa Island
Micranellum subimpressum Carpenter	Mazatlan

Genus Elephantulum Carpenter,1858

Elephantulum insculptum Carpenter	Mazatlan
Elephantulum laqueatum C.B. Adams	Panama
Elephantulum obtusum Carpenter	Mazatlan
Elephantulum subspirale Carpenter	Mazatlan

Genus Elephantanellum Carpenter

Elephantanellum abnormale Carpenter	Mazatlan
Elephantanellum carpenteri Bartsch	San Pedro to Point Abreojos
Elephantanellum heptagonum Carpenter	Gulf of Calif. to Panama
Elephantanellum liratocinctum Carpenter	Gulf of Calif. to Panama

Family Caecidae

The most important reference on this group is Bartsch, Paul in Journ. Wash. Acad. Sci. vol. 10, 1920. There is another key to genera and species.

Genus Caecum Fleming,1813. Brewster's Edinburgh Encyclopedia, vol.7, p.67. (Quoted from Sherborn, Index Animal, 1801-50, pt. 5, p. 950). Am. Ed. vol. 6, pt. 2, p. 689, 1815.

Type (by subsequent designation, Gray,1847, Proc. Zool. Soc. London, pt. 15, 203)- Dentalium trachaea Montagu. (Fide Woodring,1928).

" Shell tubular. Nucleus consisting of several whorls coiled in one plane and of a short curved tube, separated by a septum from the next stage, which is a curved tube, which in turn is separated by a conical pointed septum or plug from the adult shell. Both of these stages generally are detached from the adult shell, which consists of a tube curved in same plane as coil of nuclear whorls. Aperture circular. Adult shell smooth, or variously sculptured, generally with annular rings." (Woodring).

Caecum californicum Dall,1885. Monterey, Calif. to Lower Calif.
Type locality, San Diego.

Collecting data: Pt. Vicente, Balboa, San Pedro, Bird Rock, San Onofre, and Punta Banda, L.C.; have dredged sets from off Coronados Islands by Dr. F. Baker and sets from Pt. Abreojos and La Paz. (Burch); San Martin Island, (Baker); San Diego Bay (Kelsey and Baker); San Pedro and Pt. Abreojos (Lowe); Ocean Beach (Baker) (San Diego Museum).

Caecum dalli Bartsch,1920. Point Vicente, Calif. to Lower Calif.
Type locality, San Diego, Calif.

Collecting data: Pointe Vicente, Calif. (Strong); San Martin Island and So. Coronado Id. (Baker); San Pedro (Lowe).

Caecum licalum Bartsch, 1920. Monterey to San Martin Island (Baker). Type locality, San Diego.

Collecting data: Dredged off Avalon, Catalina Island in 35 fms. (Burch); So. Coronado Island in 7 to 14 fms. (Baker); San Martin Island, L.C. (Baker) Laguna, Calif. in 10 fms. and Reef Pt. (Strong); Pt. Vicente (Lowe).

Caecum diegonse Bartsch, 1920. San Diego, Calif. to Conception Bay, L.C. (Bancroft). Type locality, San Diego.

Collecting data: Conception Bay (Bancrodt); So. Coronado Island in 3 to 8 fms. (Baker).

Catalina Island (Lowe) south to
Caecum grippi Bartsch, 1920. Off San Diego, 15 to 20 fathoms south to Coronado Islands, L.C. (Baker). Type locality, off San Diego

Collecting data: So Coronado Island in 3 to 14 fms. (Baker); No. Coronado Island (Baker); Catalina Island in 35 fms. (Lowe) (San Diego Museum) .

* Note* The only descriptions of species of Caecidae described in 1920 by Bartsch are in the discussions of genera which Mrs. Oldroyd did not reprint.

Genus Micranellum Bartsch, 1920. Type (by original designation), Caecum crebricinctum Carpenter.

" Surface of the shell marked by closely spaced, slender, axial annulations; operculum thin, corneous, Concave." (Bartsch).

Micranellum crebricinctum (Carpenter), 1864. Forrester Island, Alaska south to San Martin Island, L.C. (Baker). Type locality, San Diego, Calif.

Collecting data: Dredged in abundance off Monterey in 20 to 40 fms.; off Pacific Grove in 15 fms.; very abundant off Redondo Beach in 15 to 25 fms.; off Malaga Cove in 15 fms.; Newport Bay; 5 miles off El Segundo, Calif. in 35 fms. (Burch); So. Coronado Island in 7 to 14 fms. (Baker); San Diego Bay (Orcutt); San Pedro in 12 fms. (Lowe); Bird Rock (Bristol).

Micranellum pedroense Bartsch, 1920. San Pedro to San Diego, Calif. Type locality, San Pedro.

Mr. George Willett in Transactions of San Diego Soc. of Nat. Hist. vol. 8, no. 30, 1937- quoting as follows " It appears to the writer that M. pedroense Bartsch and Caecum magnum Stearns as figured by Arnold, are the young of M. crebricinctum (Carpenter). This species, during juvenility, is slender, rather strongly curved, and the plug is longer and narrower; as it becomes o older, the slender part of the shell is discarded; some of the curve being l lost, and the plug becomes thicker and more blunt."

Micranellum catalinense Bartsch, 1920. Santa Rosa and Catalina Islands in 50 fms. Type locality, off Santa Rosa Island, Calif.

Collecting data: Dredged off Catalina Island in 35 fms. (Burch); Catalina Island in 35 fms. (Lowe).

Micranellum profundicolum Bartsch, 1920. Off San Diego in 55 to 199 fathoms.

Micranellum oregonense Bartsch, 1920. Prince William Sound, Alaska to San Diego. Type locality, Forrester Island, Alaska.

Collecting data: Forrester Island, Alaska (Willett); Queen Charlotte Island (Lowe); Drier Bay, Knight Island, Alaska (Eyerdam).

Micranellum barkleyense Bartsch, 1920. Barkley Sound, Vancouver Island.
Micranellum rosanum Bartsch, 1920. Off Santa Rosa Island in 48 fathoms.

Genus Fartulum Carpenter, 1856. Type (by subsequent designation, Bartsch 1920), : Caecum laeve C.B. Adams.

" C. t. laevi, cylindracea, saepius utrinque contracta; apertura saepe declivi" (Carpenter). " Shell smooth, excepting microscopic incremental lines."

Fartulum orcutti Dall, 1885. San Pedro to Mazatlan, Mexico.
Type locality, San Diego, Calif.

Collecting data: Malaga Cove, L.A. Co., Calif. among stones near high tide mark; quantities of dead eel grass and other algae among the stones. They are in our experience usually found in similar habitat. They are so exceedingly abundant that it was possible (in August) to simply shake them out of the algae and quickly collect perhaps half a gallon of the pure Fartulum. To count them would require a lifetime. We took the same species in about the same kind of place at San Onofre, Calif. and along the rocks north of Ensenada, Mexico. (Burch); South Coronado Island (Baker); San Diego (Baker and Kelsey)(Orcutt); La Jolla (Chaney); Catalina Island (Strong); San Martin Island (Baker); San Pedro (Lowe); Todos Santos Bay (Orcutt) (San Diego Museum),

and Gulf of Calif.

Fartulum hemphilli Bartsch, 1920. San Pedro, Calif. to Point Abreojos, L.C.
Type locality, San Pedro, Calif.

Collecting data: Point Abreojos (Hemphill); San Felipe (Stephens); San Martin Island (Baker); So. Coronado Island in 3 to 9 fms. (Baker); La Jolla (F. Stephens).

Fartulum occidentale Bartsch, 1920. Prince William Sound (Eyerdam). south to Lower Calif. Type locality, San Pedro, Calif.

Collecting data: South Coronado Island in 14 fms. (Baker); Scammons Lagoon (Huey); San Martin Island (Baker); San Diego (Baker); Conception Bay (Bancroft); Pleistocene of Hilltop Quarry, San Pedro (Burch).

Fartulum bakeri Bartsch, 1920. Ellamar, Alaska to Mazatlan, Mexico.
Type locality, San Pedro, Calif.

Collecting data: San Pedro, Calif. and El Morro Point, 6 miles north of Ensenada, Mexico. (Burch); South Coronado Island in 7 to 16 fms. (Baker); San Diego (Baker); Bird Rock (Baker); La Jolla (F. Stephens); San Pedro ((Lowe); Point Vicente (Strong); La Jolla (Simmons);

Genus Elephantanellum Bartsch, 1921. Type (by original designation) E. hexagonum (Carpenter).

Dr. A. Myra Keen advises " Elephantulum Carpenter, 1856 is not represented in our fauna, apparently. Note that Bartsch proposes a new genus, Elephantanellum with type E. hexagonum (Carpenter). The type of Elephantulum is Caecum abnormale Carpenter. Mrs. Oldroyd copied Bartsch's description of Elephantanellum under the heading of Elephantulum."

" Surface of shell marked by raised ridges, which coincide with the long axis of the shell; annulations strongly developed; operculum thin, corneous, concave." (Bartsch).

Elephantanellum carpenteri (Bartsch), 1920. San Pedro, Calif. to Gulf of Calif. Type locality, San Diego, Calif.

Collecting data: San Felipe, L.C. (F. Stephens); Conception Bay (Bancroft) (San Diego Museum).

Family Vermetidae

Tryon's Manual of Conchology has the following arrangement:

Shell with internal laminae ....Genus *Vermetus*
. With laminae on parietal wall ....Subgenus *Vermetus*
. With 2 ridges on columella becoming obsolete near
  apex and aperture ....Subgenus *Petaloconchus*
. With internal laminae very strong on middle section. Subgenus *Macrophragma*
. With a faint median thread on the columella .... Subgenus *Aletes*
Shell without internal laminae
. Shell attached
.. Tube with a elevated median line .... Genus *Bivonia*
.. Tube with 3-5 longitudinal lirae .... Genus *Thylacodes*
.. Tube irregularly twisted and carinated .... Genus *Siphonium*
.. Shell spiral, aperture slightly inflexed .... Genus *Stephopoma*
. Shell in a groove excavated by the animal ....Genus *Spiroglyphis*
. Shell free ....Genus *Vermicularia*

Genus *Bivonia* Gray,1847. Type (by monotypy), *Vermetus glomeratus Bivona-Bernardi*.

" Shell affixed, mostly spiral, aperture contracted, circular, with spiral, interruptedly nodulose lirae, and a median elevated line; columella smooth. Operculum small, rudimentary" (Tryon).

Bivonia compacta Carpenter,1864. Vancouver Island, to Gulf of Calif. *Maxwell Smith in Panamic Marine Shells* gives the range south to Payta,Peru. Type locality, Vancouver Island. " Barclay Sound on Pachypoma".

Mr. A.M. Strong makes the comments on the species:" Carpenter says belongs to *Bivonia* Gray (not Morch). Has the aspect of *Petaloconchus macrophagma* on a large scale, but is entirely destitute of *internal laminae*. *One specimen* had a faint columellat thread for two whorls only.

Tryon retains the species in *Bivonia* of Morch tho the description makes no mention of the median elevated *line*. No description of Bivonia Gray found."

Collecting data: Dredged off Monterey, Calif. on shale bottom; off Redondo Beach in 50 fms. gravel and shale; off San Pedro, Calif. in 20 fms. (Burch); San Felipe, L.C. (F. Stephens); Magdalena Bay " cf *compacta*" (Baker) (San Diego Museum).

Genus *Vermicularia* Lamarck,1799. Type (by monotypy), *Serpula lumbricalis* Linnaeus.

" Shell free, in its early stage regularly coiled like a *Turritella*; subsequently uncoiled, the tube variously twisted, or more or *less straight* and prolonged. Operculum size of the aperture." Tryon.

Vermicularia eburnea (Reeve),1842. West Coast, North, South and Central America; San Pedro, Calif. to Panama. Type locality, South America (fide Oldroyd).

Dr. A. Myra Keen in Abridged Check List gave the species *fewkesi*, and has advised us as follows about that " *Vermiculus fewkesi* Yates (Bull. Santa Barbara Soc. Nat. Hist. vol. 1, no. 2, p. 48, pl.2, figs. 8-9) is very probably a synonym of *Vermicularia eburnea* (Reeve), as Grant and Gale suggest. I included it in the Check List because I thought at that time there might be morphologic differences between the northern and southern forms."

The following notes re this species appear in Mr. Strongs notebook " In Maz. Cat. Carpenter says " This description (of *V. pellucidus*) will suit the young of *V. eburneus* but is not sufficiently *explicit for certainty*."

(con.)

Carpenter states that Vermetus glomeratus C.B. Adams (not Lam.) is in part this species.
Tryon gives the species under V. pellucidus B. & S. If the two are the same this has priority."

Collecting data: Pta. Libertad, Sonora (Lowe); Taboga Island (Lowe); Mazatlan; Manzanillo; Acapulco; La Paz; Magdalena Bay; Tepoca Bay and Pts. Penasco; Montijo Bay, R.P. (Lowe) (San Diego Museum). Lowe also labeled a set from Cedros Island and another from Long Beach with the name fewkesi.

Mr. Strong lists the following two species from the south.
Vermicularia pellucida Broderip and Sowerby,1829. Central America
Vermicularia hindsii Gray Lower Calif. to Tehuantepec

Genus Aletes Carpenter,1856. Mazatlan Catalogue, p. 301, August,1856) Type (by subsequent designation Cossmann,1912), Vermetus centiquadratus Valenciennes. Grant and Gale in citing Aletes from the Proc. Zool. Soc. for 1856 did not realize that this part of the volume (p.226) was not published until January,1857. The above data on advice of Dr. A.M. Keen.

" Shell spirally twisted, attached, surface often decussated, columbella with a faint median threadlike line."

Aletes squamigerus Carpenter,1856. Forrester Island, Alaska to Payta,Peru and the Galapagos. Type locality, Santa Barbara, Calif.

Mr. Strong makes the following comments in his notebook. " Carpenter in Supl. Report says a Serpulorbis not Aletes. Morch places it in Thyacodes as does Tryon. Neither recognize Serpulorbis. Why Dall returns it to Aletes is not stated. No mention is made in the description of internal armature which Tryon uses to define Aletes. Morch gives var. pennata equals margaritarum Val. of which Carpenter says " Affiliated to the California shell on supposititious evidence and probably distinct. These appear to be from the tropical fauna." Oldroyd's Puget Sound Shells gives variety pernatus Morch. Probably a misspelling and misidentification."

Collecting data: Our common worm tube needs no locality records. The bathymetric range is not great although we have dredged it off Monterey on the shale as deep as perhaps 20 fathoms so it is not strictly littoral. (Burch).

Aletes squamigerus pennatus (Morch),1860. Jour. Conchyl., vol.8 (ser.4, vol.4), p. 43. Type locality: Realejo and north of Bocorones Is.
Original description: " Coquille épaisse, fixée au coté droit, irregulierement contournee en spirale, comme coudee, avec deux carenes aplaties et rapprochees; stries d'accroissement ca et la en lamelles rudes; ombilic ouvert quadrangulairement. L'Opercule un peu concave, se compose d'elements concentriques .. Le dessus de l'opercule est pourvu de poils en rayons irreguliers ..."

Grant and Gale list this subspecies and state living West Mexico to Panama with ? . T.S. Oldroyd, Proc. U.S.N.M. vol. 65, art.22, p. 16,1925 states " Living, San Pedro, Calif.and north".

Grant and Gale state " This variety lacks the rough longitudinal striations of the typical form.".

Collecting data; We have taken specimens from the Pleistocene of Hilltop Quarry, San Pedro which we have so labelled but have never recognized it living.

Aletes centiquadratus(Valenciennes)1846. San Diego, Calif. to Panama. Type locality, Gulf of Calif.

(con.)

Mr. A.M. Strong makes the following notations on this species:
" Carpenter in Mazatlan Cat. No. 252 described the shell figured on the plates of the Voyage of the Venus and says that Vermetus peronii Val. on the same plate is a variety.

Morch places it under Aletes and gives V. effusus Val. as the same specimen/ Also gives variety maxima equals V. panamensis Chen of C.B. Adams Also a variety equals V. peronii Val. (Which Carpenter questions in Suppl. Report) and a variety bridgesii from Panama.

Carpenter in notes on Adams shells gives V. panamensis as equals Aletes centiquadratus of Maz. Cat.

Carpenter adds as a questionable variety A. imbricatus in Maz. Cat. "
Coll. Data: Manzanillo,Magdalena Bay,Kino Bay,Puntarenas,C.R. (Lowe).

Genus Spiroglyphus Daudin,1800. Type, Spiroglyphus annulatus Daudin

" Animal excavating a groove on the surface of shells or stones, covering it over with shelly material,and thus forming a tubular planorbiform case. When first hatched, the shell is spiral and regular, consisting of one and a half whorls; it soon attaches itself, the channel it excavates being at first shallow, afterward deeper; color bright purple to nearly black. The operculum is large , thick, convex exteriorly, with strong concentric laminae, plane interiorly, concentrically lirate, with central mamilla, and narrowly elevated margin." (Tryon, Manual of Conchology).

Spiroglyphus lituellus Morch,1861. Forrester Island, Alaska to San Diego, Calif. Dr. A.M. Keen advises " The type locality of Spiroglyphus lituellus is California, in young Haliotis splendens."

Collecting data: Morro Bay, Calif. from backs of Haliotis rufescens; dredged off Monterey, Calif. in 10-20 fms. on the shale (Burch); Catalina Island (Lowe) ; La Jolla (Baker) (San Diego Museum).

Genus Petaloconchus H.C. Lea,1843 Type (by monotypy); Petaloconchus sculpturatus Lea. Miocene, Virginia.

" Shell more or less regularly coiled in an open spire during part of growth,more or less straight during final stage. Early stage contorted by more regularly coiled. Aperture circular. Columellar wall bearing two relatively long thin lamellae that disappear near aperture and may be absent elsewhere. Sculpture consisting of spirally arranged crude pustules or of axial wrinkles." (Woodring, 1928, p. 347.)

Petaloconchus anellum (Morch),1861. Monterey, Calif. to San Hipolito Point, L.C. (Jordan). Type locality, California on Haliotis.

Dr. Dall listed this species in Bulletin 112 under genus Vermiculum Montagu,1803. Dr. A.M. Keen states " Vermiculum should be stricken from the list, as the genotype is a protozoan."

Collecting data: Dredged off Monterey, Calif. in 10-20 fms. on shale; Morro Bay on Haliotis rufescens; (Burch); San Pedro (Lowe); off So. Coronado Island in 18 fms. (Dr. F. Baker).

Petaloconchus macrophragma Carpenter,1857. Catalina Island to Panama. Type locality, Mazatlan.

Collecting data: Catalina Island, Calif. (Lowe)

Petaloconchus complicatus Dall,1908. Puget Sound to Panama
Type locality, near Cocos Island.

Collecting data: Dredged off Monterey, Calif. in 20 fms.; off Redondo Beach in 25 fms. gravel (Burch); Catalina Island (Lowe).

Petaloconchus montereyensis Dall, 1919. Monterey, Calif. to Catalina Island Calif. Type locality, Monterey.

Collecting data: We were at one time disposed to think this a variety of complicatus, but after bringing up numbers of specimens fitting the description exactly from off Monterey on the shale in about 20 fms. We considered it a good species (Burch); Catalina Island and San Pedro, Calif. (Lowe).

Genus Thylacodes Guettard, 1774.

Dr. Dall in Bull. 112 lists a species eruciformis Morch, 1861. Of this Dr. A.M. Keen states " The species of Thylacodes attributed to California by Morch seems to me to be a matter of erroneous locality, a s no such form has been reported in recent years." And Mr. A.M. Strong comments on it as follows " Dall lists a Thylacodes eruciformis Morch. This is probably a missprint for T. cruciformis Morch which is described with two varieties in P.Z.S. 1862, p.70. Morch gives California on Crucibulum ? umbrella and Margaritifera. Carpenter says " This species is on shells from the Mexican not the California fauna."

Mr. Strong lists the following species of the Genus Vermetus from the southern fauna.

Vermetus contortus Carpenter, 1857. Gulf of Calif. to Panama.
Vermetus albidus Carpenter, 1857 Gulf of Calif.
Vermetus tripsycha Pilsbry and Lowe, 1932 Guaymas

Family Turritellidae

The following key and list of species is from Mr. A.M. String's notebook. We will then take up a discussion of our species reported north of San Diego.

Genus Turritella

Upper whorls with a sharp central keel
• Middle whorls flattened, lower whorls more or less concave
•• White, thickly marbled with gray or reddish black
115 x 25 mm. Gulf of Calif. to Peru .... goniostoma
• Central keel strong on all whorls
•• Ash-olive, mottled with blackand white
60 x 18 mm. Panama .... banksii
• Lower whorls closely, equally, spirally ridged
•• Light red
16 x 10 mm. West Columbia .... rubescens
Three equal spiral keels on all whorls
• Rusty white, keels chestnut-black
70 x 20 mm. Chile .... cingulata
Five to eight spiral keels on lower whorls- whorl overhanging
• Whitish, profusely painted with oblique purple streaks
85 x 22 mm. Gulf of California .... leucostoma (tigrina)
Many equal, close, flat, spiral cords
• Fulvous white, cords painted with squarish chestnut spots
85 x 22 mm. Gulf of California ....sanguinea
Two prominent spiral keels separated by a central concave area
• Central area equally spirally threaded
•• Keels smooth throughout
••• Yellowish, with chestnut or chocolate longitudinal flames
60 x 13 mm. California .... cooperi
•• Keels finely beaded on lower whorls
••• Pale pinkish brown
45 x 9 mm. California to Tres Marias .... mariana

.. Upper keel strongly nodulous
... Grayish white, with brown flames between nodes
52 x 15 mm. Gulf of Calif. to Central America .... nodulosa
. Central area with two smaller keels
.. Tinted reddish brown
45 x 11 mm. California .... jewetti
Double keel at top and bottom of a central area
. Whitish, variegated with reddish brown
80 x 15 mm. Guayaquil .... radula

Genus Turritella Lamarck,1799

Turritella cooperi Carpenter,1866	Monterey to Cerros Island
Turritella jewettii Carpenter,1864	Santa Barbara to Salina Cruz
Turritella mariana Dall,1908	Catalina to Panama
Turritella nodulosa King,1831	San Diego to Panama
Turritella leucostoma Val.1833 (tigrina)	Cerros Island to Panama
Turritella goniostoma Val. 1833	Lower Calif. to Peru
variety banksii Reeve,1849	
Turritella sanguinea Reeve,1849	Gulf of Calif.
Turritella rubescens Reeve,1849	Panama
Turritella cingulata Sowerby,1825	Ecuador to Chile
Turritella radula Kiener,1840	Ecuador

Genus Turritella Lamarck,1799. Type (by monotypy), Turbo terebra Linne.

" Shell slender, many-whorled, spire high, whorls more or less bulging or flat. Aperture broadly ovate. Outer lip of type species flexed backward near suture, then extending backward and more gently forward, forming a broad shallow asymmatric sinus. Other species have outer lips of different shape. Sculpture of type species consisting of heavy spiral threads between which lie very fine spiral threads. Some species have beaded spiral cords."(Woodring

Turritella nodulosa King,1831. San Diego, Calif. to Panama, to Ecuador(Lowe)

Collecting data: Acapulco in 20 fms. (Lowe); Manzanillo in 20 fms. (Lowe); Tenacatita Bay, Mex. in 35 fms. (Huffman); La Paz, L.C. (Lowe); Guaymas,Mex. and Taboga Island, Panama (Lowe); Ecuador (Lowe)

Turritella mariana Dall,1908. Catalina Island, Calif. to Panama Bay. Type locality, near Tres Marias Islands,Mexico in 50 fms.

Collecting data: Ship Rock, Catalina Island in 40 fms. (Strong); Acapulco and Manzanillo in 20 fms. (Lowe); Long Beach, Calif. (Lowe); off Newport, Calif. (Tremper)(San Diego Museum).

Turritella pedroensis Applin,1941 (Turritella jewettii)

Dr. W.P. Woodring advises on this species as follows (Per. Comm.) " Turritella jewettii of your list is now known as T. pedroensis Applin,1941 (in Merriam,C.W., Fossil Turritellas from the Pacific Coast Region of North America: Calif. Univ. Dept. Geol. Sci. Bull. vol.26, pp. 121-123, pl.35, figs 1-9). I am accepting pedroensis instead of Arnold's usage of jewettii since there is much doubt about jewettii , the type of which appears to be no longer extant." Dr. A. Myra Keen comments " Dr. Woodring's comments on Turritella jewettii and on Merriam's paper are not open to challenge."

Collecting data: If I understand this species correctly we have found it in considerable abundance in the Hilltop Quarry Pleistocene and also Timm's Point of San Pedro, Calif. , but have never recognized a Recent specimen." (Burch)

Dall gives the range Recent from Santa Barbara to Salina Cruz,Mexico.

Turritella cooperi Carpenter,1864 Monterey, Calif. south to Cerros Island ,Mexico (Baker). Type locality, San Pedro, Calif.

Collecting data: Off Monterey,Calif. in 50 fms.; off Avalon, Catalina Island in 25 fms.; off El Segundo, Calif. 5 miles out in 35 fms. rockand gravel; off Redondo Beach in 25 fms. gravel south side of submarine canyon; in 50 fms. on north side of canyon; off Ensenada, Mexico in 50 fms.; a very common fossil in the Pleistocene of Timm's Point, San Pedro (Burch); San Pedro (Hemphill); San Pedro in 10 fms. (Lowe); Cerros Island, L.C. in 14 to 30 fms. (Baker); Long Beach (Lowe) (San Diego Museum).

Genus Turritellopsis G.O. Sars,1878. Type, Turritellopsis acicula Stimpson(by monotypy).

" Shell, like Turritella but the lingual dentation differs" (Tryon). "... the whorls of the spire grooved across; aperture oval; radula without marginal teeth. Inhabits boreal seas."

Turritellopsis acicula stimpsoni Dall,1919. Nunivak Island, Alaska south to San Ignacio Lagoon, L.C. (Eric Jordan). Type locality, San Diego.

Collecting data: Dredged off San Juan Islands, Puget Sound by Trevor Kincaid,1940 (Burch); Teller, Bering Sea; Kodiak Island, Alaska in 13 fms.; Montagu Island, Pr. Wm. Sound in 18 fms. (Lewis) (Willett).

Genus Tachyrhynchus Morch,1868. Type (by subsequent designation Cossmann 1912): Turritella lactea Moller.

" Shell like a small Turritella, the whorls of the spire grooved across, and rounded; sculptured by spiral and longitudinal lines. Aperture oval, slightly produced in front into a rudimentary channel; lip sharp"

Identifications of specimens in this genus has been a mooted question with us for years. Grant and Gale state " This shell looks like some species of Bittium but it is supposed to have a multispiral operculum with central nucleus, whereas Bittium has a paucispiral operculum."

Reference to our discussion of Bittium subplanatum and Bittium catalinense dredged in vast numbers off Redondo Beach and Catalina Island in 50 to 150 fathoms mud bottom will give a clue here. Among this mass of Bittium we found specimens seeming to fit the description of Tachyrhynchus . The was many for the most part unsuccessful efforts to study the operculum of these small things. Mr. George Willett thought that he had it and labelled a large lot of the shells we dredged off Redondo Beach, Tachyrhunchus pratomus However, I was never able to see this difference in the opercumum, personally and still have my serious doubt if the things we have been labelling Tachyrhynchus are not in reality something that should be in the same basket with the Bittiums. However, we have several species identified by Dr. Fred Baker from off Point Loma, off Coronado Islands and from the Gulf. Of course, any one would instantly say Bittium at first glance as far as the shells are concerned. However, they can be separated from the Bittiums on sight because of the lack of sculpture but they resemble other species of Bittium too much for one to feel certain about them. (Burch).

Tachyrhynchus erosus (Couthouy),1838. Arctic Ocean, south on the west to the Kuril Islands and on the east to the Aleutian Islands and Kodiak,Alaska. Also Greenland. (Dall). Prince William Sound (Eyerdam). Type locality, Massachusetts Bay, coast of Maine.

Collecting data: Punuk Island, Bering Sea (Lewis); Drier Bay, Alaska (Eyerdam); Ancha Bay, Kamchatka (Lowe);

Tachyrhynchus erosus major Dall,1919. Mouth of the Colville River,Arctic Alaska and south through the eastern part of Bering Sea to the Pribilof Islands and Unimak Islands (Dall). Type locality, off the Pribilof Islands, Bering Sea in 51 fms.

Collecting data: Drier Bay, Alaska (Eyerdam).

Tachyrhynchus reticulatus (Mighels),1842. Arctic Ocean and eastern Bering Sea to the Aleutian Islands and southward to British Columbia. Also Greenland. Type locality, Bay Chaleur, in the Gulf of Saint Lawrence.

Collecting data: Frederick Sound in 12 fathoms (Lewis) (Willett);

Tachyrhynchus lacteolus (Carpenter),1865. Chignik Bay, Alaska Peninsula, east and south to Point Abreojos, L.C. Dr. A. Myra Keen advises " Type locality of holotype: Puget Sound".

Collecting data: Montague Island, Prince Wm. Sound in 18 fms.; Humpback B. near Wrangell in 15 fms. (Lewis)(Willett).

Tachyrhynchus lacteolus subplanatus (Carpenter),1865. Puget Sound to San Diego,Calif. Dr. A.M. Keen advises " Type locality of holotype is Puget Sound".

Tachyrhynchus pratomus Dall,1919. Semidi Islands, Alaska in 20 fms. to Loma, Calif. Type locality: Semidi Islands, Alaska in 20 fms.

Collecting data: off Redondo Beach in 75 fms. to 150 fms. (as discussed above) (Burch); off Point Loma, San Diego Co. in 50 fms. (Dr. F. Baker) and also off Bay, North Coronado Island (Dr. F. Baker).

Tachyrhynchus stearnsii Dall,1919. San Pedro, Calif.

Additions and Corrections

Petaloconchus montereyensis Dall,1919. This issue- 54:45. Mr. E.P. Chace brought a set of specimens of this species to the last meeting collected at Crescent City, Del Norte Co., Calif. and also a set from Point Vicente, Los Angeles County. The Crescent City record is an extension of range northward.

Vermicularia eburnea (Reeve), 1842 This issue 54:42 Mr. E.P. Chace submitted specimens of this species at the recent meeting collected at San Pedro, Calif.

Cerithidea californica hyporhyssa (Berry),1906. This issue 54:34-35. Mr. E.P. Chace states " My set collected in San Diego Bay back in 1914 or 1915 has some shells that have very flat whorls and an almost straight line from apex to aperture, and do not have an eroded appearance. Other shells from the same collecting have rounded whorls and an eroded appearance. All are more slender than the usual form- C. californica."

Littorinidae
Lacunidae
Rissoinidae
Litiopidae
Barleeidae (new)

Rissoidae

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
December 1945

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, non-members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or $1.25 each six months.

We are now meeting at the Los Angeles Museum, Exposition Park, Los Angeles, Calif. on the first tuesday of each month at 7:30 P.M. All interested persons are welcome. Next meeting Jan. 8,1946.

Please mail all news about our mutual interests to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37,Calif.
Phone AX 2-7965

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The following letter from Dr. Paul Bartsch, Smithsonian Institution, United States National Museum, Washington, D.C. is appreciated.

" Your " Minutes of the Conchological Club ..." have come to hand, and I am rather interested in your treatment of Melanella. May I express an opinion contrary to your conclusions and those of Dr. Keen ?

Bowditch's figure of Melanella dufresnii is characteristically that of almost all of your curved West Coast Melanellids. You will find that these have a peripheral angulation like that shown in Bowditch's figure. No Stylifer that I recall has such a form, all of which appear to have the last whorl rounded at the periphery. I think Winckworth, therefore, was in error. The typical group of Melanella is what I call Balcis.

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The Van Cleef Memorial Library, Cornell University, Ithaca, N.Y. - Elizabeth Congdon, Librarian. " I was very much interested in the note regarding early numbers of Nautilus (published as Conchologist's Exchange) on p.43 of the October number of the Minutes.. We have a few of vol. 1 and 2, and would like to secure the missing ones to complete our set. Can you, or any members of your club, give us any help in this project ? We would like to find vol.1, no. 1-4,7 (1886-1887) and v.2, no. 1-8(1887-1888). If you know of the existence of any duplicates of these numbers that are available, we shall be glad to pay a reasonable amount for them."

Professor H.W. Miller, Apartado 1320,San Jose, Costa Rica. We are very happy to have two long letters from our active member. It seems a long time since we enjoyed his company at our meetings. The following are some excerpts from his letters.- " With my wife and two girls that stay with us I spent May 10-12 at the Boca de Barranca, a small twon on the beach near Puntarenas. While it is not the best place for collecting we have seen, neither is it the worst. It offers quite varied collecting grounds, having sand beaches, river mouth, estuary, and rocky cliffs, but is peculiar in that all but the smaller shells are usually too broken up to be of any value in a collection. The four of us brough back about 130 species, some of which were quite broken. Some 25 or so of them were new to our collection. As I have so little literature at hand I wish to correspond a bit with Doctor Hill before I send you a list of the species collected. I was interested in the article by erdam on extended ranges. We also have Pseudocyrena mexicana B. & S. here in Costa Rica and Dr. Hill identified a Donax navicula Hanley for me in 1940.

(con.)

Incidentally I found the latter quite common on the beach at the Boca de Barranca this year. As I was not equipped for bringing much material this time I brought back more information than shells. I plan to make a trip to Puntarenas sometime soon and perhaps a trip to Limon on the Caribbean. If I can make it, I have quite a sizable trip planned to begin in the latter part of December or the first of January. I took a hammer and chisel this time and worked the fossil beds as well as the living rock borers. I found fossil Chione,Dosinia,Turritella,Modiolus,Ficus,Polinices,Epitonium,Nassa, Architectonica and some others. The deposits are exposed at median tide and although at sea level are true fossils of a different material from the rocks in which they are found. The material is a translucent crystalline deposit and many of the double bivalves are hollow. Sometimes where the projecting end of a bivalve had been broken by the surf, exposing the hollow interior, there were groups of Littorina aspersa living in the hollow of the fossil. Rather an interesting situation. Saw some alligators also. "

The following is from a later latter. " Since I wrote the other letter I went to Limon, on the Caribbean. A friendand I hiked along about five or six miles of difficult beach (rockand coral with timber and brush right down to the water line, which didnt help much when the tide came in) and I found a number of species alive that I had never taken alive before and a few that I had never taken at all. Then before coming home I gathered a lot of sand from beaches inside the reefs and found a lot of interesting microscopic species that I had never paid any attention to before. I plan to get more specimens of that sand. It is full of interesting things. All dead, of course. Now I want to go back some time and explore the shallow water where they live. It would be easy to spend a month or two just in Limon. Then later I took another friend, a student who comes from the Bay Islands of Honduras and is a shell fan, who, by the way, brought a nice lot of stuff with him when he came, and went to Puntarenas. We got a canoe and a shovel and spent the day on the mud and sand bars in the Estero with little results. It was not the right time of year for that kind of collecting. The mangrove swamps gave a better yield of Littorinas, pulchra,fasciata, and varia all being common. As the collecting was not too good there we went out on the Boca de Barranca where we got over sixty species of dead shells before we even reached the hotel, just walking along a couple of hundred yards of beach, some of them new to me. In all, we got about 130 species at that place and many of them can be taken alive almost any time one wants to go after them. So far I have never had the luck to find the microscopic species numerous on the Pacific Coast. The other two Littorinas that are common on rovk beaches are always to be found here. After the school year is out I will sit down and write you a more detailed description of some of these places where I have collected. "

Professor Miller describes in detail his plans to make use of a motor boat and dredging equipment in the Bay Islands. We look forward with interest to hearing of this excursion.

W.J. Eyerdam inquires for the address of Lewis who collected in Alaska. The Lewis collection is now in the Los Angeles Museum and no doubt Dr. H.R. Hill can advise about this matter.

Arthur P. Hahnel,Royersford,Penna. is an enthusiastic collector and interested in purchasing fine shells.

Mrs. Effie M. Clark, our efficient secretary, has been very busy lately packing her extensive study collection of fossil shells from the Hilltop Quarry and other deposits. She is donating them to the U.S. National Museum, Wash. D.C .

Mrs. Henry Calcutt,South Berwick,Maine is interested in buying shells.

Max Lorenz,36 Garden Place,Brooklyn, N.Y.C. is interested in buying shells

Minutes of the October,1945 meeting of the Conchological Club of Southern California-

The Conchological Club of Southern California met at the usual time and place Oct.7,1945. There were present 17 members and one visitor, Mrs. Araminta Blanchard,545 S. Hobart St., Los Angeles , who expressed a desire to become a member of the club. Three of those present were members who had been long absent from our meetings- Mr.and Mrs. Gillis for almost three years, and John Brookshire, a flyer from overseas. We were also glad to have with us Mr.and Mrs. Harrt Turver who have not been here long enough to get the habit of regular attendance. We need themand hope they will be with us often. There were no reports of standing committees. The first item of business was a motion which was carried to change the time of meeting back to one of the earlier dates, 7:30 P.M. of the first touesday of the month. The meeting room only will be changed and an appropriate guide will see that those attending will find the proper place. We were given a short talk by John Brookshire who will at a later date tell us more fully of his experiences and show us some of the shell treasures he has brought back with him.

The regular lesson which is outlined elsewhere in the notes used up the rest of the time allotted to us before closing of the museum.

A goodly number of " extras" were contributed by John Burch and enthusiastically " gobbled up". The meeting was then adjourned.

Effie M. Clark, Secretary.

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Walter J. Eyerdam , Port Vita, Raspberry Island, Alaska- " The most notable part of my shell collecting here is that the ranges of Pecten caurinus has been extended about 700 miles N. westward from Wrangel Narrows and the same can be said for the nudibranch Melibe leonina or lion's head altho it is common in Prince Wm. Sound, but I believe has not been reported north of S.E. Alaska. I collected several specimens of this curious animal which is transparent and has an enormous mouth and peculiar appendages. It is so delicate that it falls to pieces from its own weight when taken out of water. It is more fragile than a jelly fish. Specimens up to 6 inches occur in Raspberry Strait.

Day before yesterday the watchman at Iron Creek about a mile from here killed an enormous bear which was becoming too dangerous. I often followed his trail and saw where he slept the night before. Once about six years a go he caused our curer, a Scott with plenty of nerve to dive off a rock into the sea when he duddenly met up with him. A few months ago he swiped a side of beef from the cook house at Iron Creek. Anyway this was the largest bear I have ever seen in or outside of a zoo. Fourteen of us went over to Iron Creek and a lot iof photos were taken. Then we dragged him about 100 feet down his own trail. It took 14 strong men pulling as hard as we could on a down slope We had to stop every few feet because of his weight. I dont know how heavy he was. At least 1500 pounds. He was exactly 10 ft. long from his heel to his nose and could reach 12 ft. high. He was very fat and as big around as a barrel. His head was 22 inches wide and front paws 11 inches wide. Yesterday the gang went over again to help skin the bear but he was stinking badly and swolled up. I was the only one that returned to do any skinning, but I decided it was too much of a job, so I cut off his enormous head and stood the terrible stench of rotten blood and grease that bubbled out. The blowflies were there by the thousands. I worked until late at night defleshing the skull which I now have cleaned for my collection. He was a very old bear, perhaps 40 years old. The skull is undamaged. These Kodiak bears are the largest in he world and have great strength. He was so big that he could smash his way right through a house without much trouble. This one was black. The The watchman and I dug a big hole and tumbled him into it and buried him. At least his big skull will be a trophy from the king of Raspberry Island. "

Walter J. Eyerdam,7531 19th Ave/. N.E., Seattle 5, Wash. " Last wednesday I returned from Alaska. It was quite a stormy voyage across the Gulf. Most of my things were on a fishing boat. I just got them home yesterday."

Mrs. Agnes E. Wolf, 829 W. Grand, Port Washington, Wisconsin. " I am looking for an Arca chemnitzi and am wondering if you can tell me where I can get a good specimen- both valves. Also, I am told that thwre is a colony of Helix aspersa somewhere in Oakland but cant find where and perhaps you can inform me. "

The Oakland Public Museum, Oakland,Calif. sends us their thanks and apprec-iation of the Minutes.

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Abby Gorham, a charter member of the Long Beach Shell Club recently passed away. She will be greatly missed in Long Beach shell circles.

Miss Julia Ellen Rogers recently suffered the loss of her brother, Dr. Arthur M. Rogers of Los Angeles.

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Miss M. Volk,Teacher, St. Paul's School, 14th St. West,Prince Albert, Sask. Canada. is interested in purchasing shells.

E.J. Post, 609 W. Emma St., Tampa 3,Florida. Our member in Florida is sending us a box of shells for distribution to the members. He reports 64 inches of rain so far this season which sounds like a lot of rain to us here.

Mrs. N. Matzen, Box 768, Escondido,California is welcomed to our shell circle. She is a friend of Mrs. Boerstler of Corona-del-Mar.

Mrs. E.W. Boerstler,P.O. Box 494,Corona del Mar, Calif. " Is there such a thing as a dictionary devoted to shell terms? " * Note* Before many months pass all of our members and subscribers will receive an illustrated glossary that should answer this question. We are working on it now.

" Since the coming of Mytilus edulis diegensis Cou here in Newport Bay, I am unable to find anything which I formerly found where it has taken root. They build out all around a pier for 9 inches or more so that every-thing is smothered even Modiolus capax- Not a Chama or Lucapinella callio-marginata left. .... We went out Sat.and Mr. B. got two very lovely pure white Murex trialata , the first white we have found. "

L.M. Wright, CEM, U.S. Navy, Operations Office, Navy Pier 3, Miami,Florida. Please note the new address of our member. We are promised another box of shells although Wright says that the mosquitoes make collecting difficult at this season of the year.

Cpl. Charles B. Lee, 2143 AAFBU, Sq."A", T.A.A.F., Tuskegee,Alabama. "..spent last week end collecting with Morris Jacobson of New York City at Rockaway Quite a thrill as it was my first ocean collecting and I mustadmit going n nearly crazy over my first sight of huge Spissula solidissima in abundance . Really it was a full week end. I have another brother who was redeployed home to Guam. Will you let me know if there are any conchological possibil-ities." * Note* If that brother in Guam doesnt send you some of the showiest things in your collection it will be because he is mad at you.

Mrs. Laura C. Lawry, 26 Union St., South Berwick, Maine. is interested in purchasing shells.

Miss Mavis Holloway, 32 Pentland Ave., Mt. Eden S.2, Auckland, N.Z. We wish to thank Miss Holloway for her financial contribution to our fundand also for the further issues of the notes of the Auckland Museum Shell Club The latest papers on hand are " Fossil Beds Near Auckland" being a summary of a lecture given by E.S. Richardson, and " Notes on Collecting Our Land Shells" by A.E. Brooks, and " Ecology Notes on Whatipu".

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Minutes of the Long Beach Shell Club- October,1945

After an absence Mr. Baker again was at the helm of the L.B. Shell Club on Oct.14, with twenty three present. Haven't yet decided to change meeting date although the third Friday of the month may be accepted if th room is open. The november meeting we hope to meet on the eighteenth for a collecting trip and picnic over Palo Verde way. Notices will be sent when plans are complete. The Christmas meeting, second sunday of the month, will be held at the Ulrich home. Shell packages will be exchanged and the nominating committee will report as usual. We wish to acknowledge the invitation of Dr. Hill to attend the Nov.6th lecture of Mr. Roughley " Great Barrier Reef" in Hancock Hall, U.S.C. The club also voted to support the Long Beach " Courtesy Campaighn". Miss Rogers then introduced the speakers on the subject " Divisions of the Animal Kingdom."

Miss Higgins described the amoeba as an example of the first phylum, and showed how through a single cell it carried on all the life processes of the higher forms. She showed its connection to man in that many forms caused or were acompaniments to diseases such as trench mouth, dysentery and Texas fever. Man, too, may serveas host to five amoeba, four of the flagellates, and one ciliata. Her final group was the foraminifera, fossils of which indicate the presence of nearly oil when seen in oil sands.

Grace Ferris showed how the sponge was a many celled mass working together for the good of the whole. She mentioned the sponge fisheries of the world, and spoke especially of the value of different sponges brought up from the Gulf of Mexico beds to the Tarpon Springs pier. Sheep's Wool, yellow and grass sponges were mentioned as ontainable in the markets along this interesting wharf where they were left in the sun to rot the fleshy part, beat to separate and soften the fibres, washed and bleached. As an intwresting and beautiful example of sponge she showed the Venus Flower Basket.

Mrs. Paxon spoke of the jelly fish, a colony of one celled animals, referred to the beautiful and various shapes, some umbrella like, their luminiscence, and the objectionable way some of them flatten out on the sands and sting the unwary bather. Mrs. Paxon has seen the Portuguese Man o,War as it moved about in Florida waters by the wind against its gas-filled float.

Miss Rogers spoke briefly of the coral shapes and the spiny skinned group embracing starfish, a radially symmetrical form, and the sea urchin which seems like the former with its arms curved upward and joined together.

Mrs. Ferris has mentioned how the jelly fish becomes at timed flattened out on the sea bottom. This well illustrated the next groups which Mrs. Bormann discussed, the worms, a flattened out creeping animal which revealed a lorgthening of body form. This produced what is known as bilateral symetry. Examples of flatworms were parasitic flukes and tapeworms. The round or thread worms were the vinegar eels, and the parasitic pin worms and the trichina from porrly cooked pork. The garden worm served as an example of a more advanced group, annelida, and the rotifers, polyzoans, and brachiopods represented a worm like group, given alone.

Mr. Baker wanted to claim the brachiopods as mollusks while admitting their separateness. He considers the mollusk an exceedingly important group from the shell club standpoint and quoted a poem showing it is the covering and not the fleshy part shell collectors prefer.

Miss Rogers completed the phyla, telling of beautiful Brazilian butterflies she had seen in South American gardens and referred to the illustrations in Comstock's " Spider Book". She quickly built up the " Life Tree " to man, explaining the brances in relation to each other.

An interesting meeting with a fine review of our high school biology, interppeced with many personal touches.

R.E. Eaton- Secretary.

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New York Zoological Society, 630 Fifth Ave., New York 20, N.Y. have published their September-October issue of Animal Kingdom, the magazine that goes regularly to members. It is a splendid publication.

Earl C. Huffman, 356 Stanton St., Pasadena 3,Calif. contributes the following interesting collecting note.

New Locality for Helminthoglypta tudiculata (Binney).

While visiting the Hitt-Bloomfield ranch, at Spadra,California, four miles west of Pomona, in September,1945, I noticed that a huge limb had fallen from a large umbrella tree. Upon questioning the owners as to the cause of the damage to the tree, I was told that apparently a slight wind had caused the limb to break off, and it was found that the whole interior was in a state of decay, which would soon necessitate the removal of the entire tree. They told me that the tree was very old, having grown there for several generations. I began digging into the core of the old trunk, and found in a few minutes a total of 57 of the Helminthoglypta tudiculata. The owners have promised that when they remove the old landmark, they will be on the alert for more of the shells.

It being such a surprise to find species of this kind about 10 miles from the nearest place- San Antonio Canyon, where they have been discovered, the question arose as to how they got there. A little reminiscing brought to mind the flood of 1913 which came racing across the ranch from the east with a wall of water about 2½ to 3 feet high. They recalled that it filled cellars to the brim, and also swept a neighbor boy and motorcycle into a ditch from the highway in front of their place.

I believe the high water must have carried these shells along from San Antonio Canyon, and that some must have lodged in this old umbrella tree at that time 32 years ago. At some future date I hope to be able to make a further search in and around that locality for more Helminthoglypta tudiculata.

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Dr. A. Myra Keen, Box 1563, Stanford University, Calif. in a recent letter contributed the following items about some of our friends.

" I had the pleasure this week of meeting Lt. V.D.P. Spicer, who dropped in for a few minutes. I have heard that Jack Dowdle may soon be a visitor here on his way home to Los Angeles from New Guinea. Lt. Colonel Hubert Schenck is now Chief of the Natural Resources Division at General Headquarters of the Supreme Commander for the Allied Powers, in Tokyo. He flew from Manila to Tokyo early this month to take up his new duties."

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Mr. A.G. Smith of Berkeley,Calif. and your editor accompanied by Mrs. J.Q. Burch drove down to Stanford University and spent the afternoon of Nov. 11 as the guests of Dr. A. Myra Keen. It was after dark when we left. Between discussing mooted questions, examining sets of specimens of particular interest from the great Stanford Collection, and marveling at some of the rare books, we really put in an afternoon.

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Homer V. Geib, Box 773, Palm Beach, Florida. We were sorry to learn that our good friend had returned to his old home in Florida after having been with us several years but feel a little bit molified by his remark " However, it is my hope to be able to arrange matters, so that I can spend part of the year with you and part of the year in Florida."

Wray Harris, Bishop Museum, Honolulu, T. Hawaii. We feel honored to add this address to our mailing list.

Dr. B.R. Bales, 149 West Main St., Circleville, Ohio. " We espect to spend most of the winter at Marathon, on Key Vaca. If any of the members of the Conch. Club are in Florida and get as far south as the Keys, have them look me up at Marathon and I'll be glad to show them around to the various good collecting localities." The editor for one would surely like to take Doc up on this but must wait until another season.

Additions and Corrections

The following notes received from Mr. Allyn Smith deal with the groups discussed in Minutes #53 and #54.

" The Neosimnia from Monterey is a beauty; have seen nothing like it. Can't decide whether it is new or the true vidleri. If the latter, then my former conception of vidleri is all wrong, and what I thought was vidleri may turn out to be loebbeckeana. You remember I mentioned in my notes the specimens from Monterey with the indistinct white band across the body whorl. Your Monterey specimen is not like this and there are other marked differences. However, you do have a specimen with the white band from southern California, smaller than the Monterey shells in the CAS, but undoubtedly not true barbarensis. The figure of the type of loebbeckeana , given by Schilder and reproduced in outline on page 40 of the last Minutes (#53), show a double dashed line across the middle of the shell. If this was intended to represent a color band, as I think is quite likely, then I think we can settle the shells with the indistinct white band as loebbeckeana. This would then result in the identification of your Monterey specimen most probably as the real vidleri. I am going to write my labels on this basis until somebody comes up with a good reason to change.

Your lot of Neosimnias from Magdalena Bay contain at least two species. the purple ones with the columellar shelf are inflexa. The lighter colored ones with the striations belong to an undescribed species and are like those in the Academy Collection from the same locality.

There is one correction that should be made in reference to Fusinus diminutus Dall in the Minutes #50, p. 36 (bottom). Mac went over the diminutus again while he was in Washington and discovered that the type of diminutus is a real Fusinus , and therefore the species stands. The confusing fact was that there were also specimens of Ocenebra lurida munda in the type lot . My note on this in the Minutes, as cited, should therefore be disregarded. Another correction that also should be made is that the type of F. kobelti as figured by Dall in Proc. USNM, 1891, is from Catalina. Dall says so in the explanation to the figure. Therefore Mrs. Oldroyd was wrong in assigning the type to Monterey. It is true, however, that Dall covered a young specimen from Monterey in diagnosing kobelti , thus confusing the situation. The Monterey shell is another species.

The Ocenebras Beatrice showed me are a puzzle that I doubt if I can straighten out without more information. The Ocenebra epiphanea from the gravel bed off Redondo checks well with the original description and I would not change the identification. However, I have a strong suspicion that epiphanea is a deep water variant of foveolata. More material is needed to settle the point.

There are three species in the material collected by Mrs. Randall at Imperial Beach. One is extremely like our new one from Monterey, so much like it, in fact, that I would almost label it as such. However, I want to see the type of O. squamulifera, which Dr. Keen says is at U.C. before making a final decision. The other two species have me stumped, at present. One of them has rather prominent varicial nodes, is rather light in color, with brown markings on the spaces between the varices. This may be O. fusconotata, but I'm not sure yet. The other species appears to be most common at Imperial Beach, judging from the number of specimens that Mrs. Randall collected. The shells of this look like a small edition of O. foveolata. If I had a growth series of foveolata to check against, this would help. Can you loan me a set from your collection ? I don't have any young ones in my collection- neither does the CAS.

The pretty little Amphissa labelled cymata is, I am sure, the color variant called lineata by Stearns. It was figured without description in the Proc. Calif. Acad. Nat. Sci. ser.1, as cited by Dall in Bull. 112.

The figure looks exactly like your shell, which incidentally is the subspecies incisa of versicolor. The description of cymata, which appears to be just another color form, calls for axially waved lines on a white ground- a common form. Your shell has spiral color lines, not axial.

Bittium eschrichtii montereyense Bartsch- Monterey, shore to 10 fms., abundant. Also abundant all along the Mendocino Co. coast. Occasional specimens from Monterey and vicinity show the coarser sculpture of eschrichtii, as given in Bartsch's figure and this is also true of the Mendocino Co. lots. The type of montereyense came from Monterey, as indicated in the table of " specimens examined" in Bartsch's paper. Pleistocene, 3 mi. N. of Cayucos .
Bittium paganicum Dall- 292-356 fms. off Pt. Pinos (USFC).
Bittium attenuatum Carpenter- Shore to 20 fms. in Monterey Bay; common. Lives at low tide among eel grass roots. There are several pretty color forms of this species.
Bittium attenuatum multifilosum Bartsch- I have not collected this at Monterey and so far as I know the only one reported from there is the specimen in the U.S.N.M.
Bittium subplanatum Bartsch- This is as good a point as any to hazard the opinion that the subgenera of Bittium , as used by Bartsch, seem to me to be based on characters that are so variable in many of the ornamented species that their systematic standing is questionable. I would be inclined to disregard them for this reason. If what you say is correct about the variation of subplanatum, then the proper proceedure would seem to require making this a subspecies of catalinense , with inornatum (if it is to be considered valid) another subspecies. The Monterey Bay record for subplanatum is 66-73 fms. off Pt. Pinos (USFC). It appears to be rare in the bay.
Bittium quadrifilatum Carpenter- Monterey Bay, shore to 40 fms. scarce
Bittium quadrifilatum ingens Bartsch- This is now Cerithiopsis ingens B. Bartsch switched the genus in his 1911 paper.
Bittium rugatum Carpenter- Would like some specimens for comparative purposes
Bittium interfossum (Carpenter)- Monterey Bay, beach drift and at low tide.
Bittium tumidum Bartsch- Now Cerithiopsis tumida Bartsch. Same situation as for B. quadrifilatum ingens.
Cerithidea californica (Haldeman)- Not found in the vicinity of Monterey . It is hard to understand why it should not be in Elkhorn Slough, but it evidently is'nt there.
C. californica hyporhysa Berry- Would let it stand.
Caecum californicum Dall- Monterey Bay, 10-30 fms. (Gordon).
Caecum licalum Bartsch- Monterey Bay, 10-30 fms. (Gordon).
Micranellum crebricinctum (Carpenter)- Monterey Bay, 10-35 fms.
Micranellum oregonense Bartsch- Monterey (Bartsch). Dont know it.
Fartulum occidentale Bartsch- 15 fms. off Pacific Grove, Monterey Bay, rare
Bivonia compacta Carpenter- Monterey Bay, shore to 25 fms.
Vermicularia fewksii Yates- May be conspecific with eburnea, but this is a pure guess. Yate's paper is exceedingly rare. Some of these days I hope to get a photostatic copy.
Aletes squamigerus Carpenter- Monterey Bay, between tides
Vermiculum anellum (Morch)- 15-25 fms., Monterey Bay
Spirogryphus lituellus (Morch)- Monterey Bay, shore to 15 fms.
Petaloconchus montereyensis Dall- 10-25 fms., Monterey Bay
Petaloconchus complicatus Dall- Not in our Monterey list and is an addition.
Turritella- The latest reference on this genus is: Fossil Turritellas from the Pacific Coast Region of North America, Univ. Calif. Publ. Geol. 26:1-214, pls. 1-41.
Turritella cooperi Carpenter- Scammon's Lagoon (Univ. Calif.); Monterey Bay, 40-60 fms..

(con.)

Turritella jewettii Carpenter- Merriam states that the type is lost and no topotypes answering the description have been found. The type locality is the Santa Barbara region " two miles from the coast and 150 feet high" (Jewett). The only Turritellas known from this region (later Pliocene or Pleistocene, are members of the T. cooperi stock. Merriam believes jewettii to be a variant of cooperi, as it was named by the same author, and that it probably should be allowed to stand. It is not a Recent species.

Turritella sp. Have a set of shells obtained from Mrs. Baldridge years ago that seem different from cooperi. They were evidently obtained in deep water by fishermen off Long Beach. The largest shell measures:length 93.0; diam. 17.2 mm. Another measures 65.0 mm. long. The smallest of the four in the lot is cooperi size, measuring 45.6 mm. long, but has only 17 whorls as against 22 whorls for the largest specimen. Do you have anything like this ?

Turritella mariana Dall- 40 fms. off Ship Rock, Catalina (Gordon).

Tachyrhynchus lacteolus Carpenter- Records in Gordon Coll. as follows: Pr. Wm. Sound (T.S.O.); Departure Bay, B.C.; Gabriola Island, B.C.; Kodiak Id .: Avancha Bay,Kamchatka; Sitka; Monterey Bay, 63 fms.

Tachyrhynchus stearnsii Dall- Off Balboa, 67 fms. (Gordon).

Tachyrhynchus erosus Couthouy- Records in Gordon Coll. are: Sitka; Kodiak Id.; Avancha Bay,Kamchatka- all collected by T.S. Oldroyd.

Family Littorinidae

Genus Littorina Ferrusac,1822. Type (by subsequent designation, Rang 1829, fide Dall and Iredale), Littorina littoralis. Grant & Gale, p. 780

Bequaert, Jos. C. " The Genus Littorina in the Western Atlantic", Johnsonia #7,1943, discusses the type designations and history of the genus and most of the subgenera.

" Shell turbinated, thick, pointed, few-whorled; aperture rounded,outer lip acute, columella rather flattened, imperforate. Operculum paucispiral. (Tryon).

Subgenus Littorina s.s.

Dr. Dall described Section Algaroda in 1918 and placed the west coast species squalida under it in Bulletin 112. Bequaert states that the type of Algaroda, by monotypy, is Turbo littoreus Linnaeus,1758 which would place it in the synonymy of Littorina s.s.

Littorina squalida Broderip and Sowerby,1829. Cape York, Arctic Ocean to Pribilof Islands and the Oshotsk Sea.(Dall). Type locality,Oceano boreali .

Collecting data: We have one set of this species collected by W.J. Eyerdam at Petropavlosk,Kamchatka in 1928.

Further comment on the subgeneric allocation of the above species is made by Dr. Joshua L. Baily Jr. (Per. Comm. Oct.,1945 as follows: "When Dall described Algaroda as a subgenus of Littorina and made L. littorea the type, he was under the impression that Rang's type designation of L. littoralis determined the type of Littorina s.s. This is the way in which he used the terms in Bull. 112. Later, when he found that Blainville had designated as the type of Littorina, L. litorea in 1828, one year earlier than Rang's designation, he recognized that Algaroda must fall within the synonymy of Littorina s.s. and so stated in Proc. USNM v.63, Art.10, p.3, 1924. The group which was called Littorina s.s. in Bull. 112 must therefore be called Neritoides Brown,1827, but as pointed out in Johnsonia, this name was preoccupied by Neritoides Meuschen,1779, so that the next available name, Neritrema Recluz,1869 must be used for the group represented on our coast by L. palliata Say,1822 which Dall reports in Bull. 112 from the PliO--cene of Nome,Alaska but not known living on the Pacific side."

The following key and list of species is from Mr. A.M. Strong's notebook.

Genus Littorina
Surface sculptured with distinct spiral ridges
. Shell large, over 20 mm. in height
.. Pale grayish or brownish, variously streaked or dotted
Height 30 mm. Magdalena Bay to Peru .... varia
. Shell small, less than 20 mm. in height
.. Spiral ridges roughened by lines of growth
... Whitish, lined or dotted with chestnut
Height 16 mm. Cape San Lucas to Panama................. aspera
.. Spiral ridges smooth
... White or yellowish, dotted with brownish
Height 15 mm. Gulf of Calif. to Ecuador .... conspersa
Surface sculptured with close-spaced spiral grooves
. Upper part of whorls concavely flattened
.. Brownish or reddish, with oblique dark flames
Height 35 mm. Panama to Ecuador .... zebra
. Periphery of body whorl angulated
.. Bluish, with oblique solid or dotted lines
Height 10 mm. Gulf of Calif. to Panama .... philippii
.. Whitish, banded with bluish
Ecuador to Chile .... thersites
. Whorls rounded see above .... varia
Surface smooth or with fine spiral striations
. Shell large, over 20 mm. in height
.. Pale grayish or brown, variously streaked or dotted
see above .... varia
.. Darl chocolate, with zigzag white markings
Height 22 mm. Central America to Chile .... peruviana
. Shell small, less than 20 mm. in height
.. Periphery of body whorl more or less angulated
... Whitish or brownish, obscurely banded
Height 12 mm. Nicaragua to Chile .... araucana
... Whitish, with oblique brownish lines
Peru and Atlantic .... ziczac
.. Periphery of body whorl not angulated
... Columella broad and excavated
.... Colors and color markings varied
Height 15 mm. Puget Sound to Magdalena Bay .... planaxis
... Columella not excavated
.... Uniformly dark, or with white axial lines or spots
Height 12 mm. Alaska to Socorro Island .... scutulata
.... Brownish, with fine whitish spiral lines
Height 10 mm. Cape San Lucas to Panama .... pullata

Littorina scutulata Gould, 1849. Alaska to Socorro Island
Littorina planaxis Philippi, 1847. Puget Sound to Socorro Island
Littorina pullata Carpenter, 1857 Magdalena Bay to Panama
Littorina varia Sowerby, 1824 Magdalena Bay to Peru
Littorina aspera Philippi, 1845 Cape San Lucas to Panama
Littorina conspersa Philippi, 1847 Cape San Lucas to Panama
Littorina philippii Carpenter, 1857 Gulf of Calif. to Guatemala
Littorina peruviana Lamarck, 1822 Central America to Chile.

(con.)

Littorina araucana d 'Orbigny,1840.	Nicaragua to Chile
Littorina zebra Donovan,1825	Panama to Chile
Littorina thersites Reeve,1857.	Ecuador to Chile
Littorina ziczac Gmelin,1791	Peru, Atlantic

Genus Tectarius

Tectarius galapagensis Stearns (atyphus),1892.	Gulf of Calif. to Ecuador
Tectarius porcata Philippi,1844	Galapagos- Indo Pacific

Genus Peasiella

Peasiella roosevelti Bartsch and Rehder,1939	Galapagos

Discussion of the species reported north of San Diego continued.

Subgenus Littorivaga Dall,1918. Type, Littorina sitchana Philippi,1846 " Comprises snails with a thick turbinate shell, decidedly convex whorls, a moderately high,pointed spire,and a short curved inner columellar edge" (Bequaert).

Littorina sitkana Philippi,1846. Dr. A. Myra Keen advises that the spelling of this species sitchana is an unjustified emendation.
Range: Southern Bering Sea, both coasts, and southward on the east to Puget Sound (Dall). Type locality, Sitka,Alaska. to Crescent City,Calif.

Collecting data: Port Orchard,Washington; Fauntleroy,Wash. on small gravel along the beach (Burch); Strait of Juan de Fuca; Unalaska Island; Vladivostok,Siberia (W.J. Eyerdam); 5 Alaska stations and Victoria,B.C. (Mrs. Kate Stephens); Ellamare,Port Graham,Alaska and Tacoma,Wash (Baker); Hokkaido,Japan(Baker); Forrester Island,Alaska(Willett); Crescent City, Calif.- Young (Cooper).

Littorina atkana Dall,1886. Kyska Island,Alaska and eastward to Cook's Inlet. Type locality, Bering Sea.
Collecting data: Umnak Island, Alaska (Willett).

Littorina aleutica Dall,1872. Pribilof Islands and the Aleutians from Kyska eastward to the Chika Islands, on isolated inlets. (Dall). Type locality, Gull Rocks, Akutan Pass, Aleutian Islands.
Collecting data: Umnak Island, Alaska (Willett)

Littorina gronlandica Menke,1830. The Okhotsk and Bering seacoasts and eastward to Sitka,Alaska; Puget Sound ? Also Greenland (Dall).
Type locality,Greenland.

Collecting data: Cook's Inlet and Ellamore,Alaska (Baker); Red Bluff Bay, Alaska (Kate Stephens); Reykjavik,Iceland (Lowe Collection); Swedon (Anderson) (San Diego Museum of Nat. Hist.).

Littorina rudis Donovan,1800. Aleutian Islands to Puget Sound, Also Atlantic. Type locality, Banks of the Tamar in Devonshire.

Dr. A. Myra Keen comments as follows; " For some years I have been trying to find a west coast specimen that compares favorably with topotypic material. At the National Museum I made the following notes:" West Coast form has lower spire,rounder aperture,with bevelled columellar margin; English form with a tendency toward umbilication. Most USNM specimens seem to be L. sitkana,a few groenlandica." Hency, I have yet to see a West Coast specimen I can confidently call L. rudis."

Collecting data: In view of Dr. Keen's observations the following records are perhaps erroneous but they are what we have been callin rudis.

Port Orchard, Wash. (Burch); Unalaska,Aleutian Islands (Eyerdam); Port Clyde St. George Co Knox Co., Maine (N. Lermond); Tacoma, Wash. (Hemphill); Atlantic and Europe (San Diego Museum).

Littorina planaxis Philippi,1847. From Puget Sound south to Magdalena Bay, Guadelupe and Socorro Islands. Type locality, California Superior

Collecting data: At and above the high tide mark all along the coast, covering all cliffs, breakwaters etc. Easily identified by the flattened columella. Young shells are banded with white and appear quite different at first glance. (Burch); N.E. Guadelupe Island, L.C. (Huey); No., middle and south islands, Los Coronados (Stephens,Baker and Huey); San Martin Island, L.C. (Baker); San Nicholas Island (Lowe); all along the coast to San Francisco (San Diego Museum).

Subgenus Melarhaphe Menke. Type, Melarhaphe glabrata Menke = Turbo neritoides Linnaeus. " comprises snails with a moderately thick, ovate-conical to ovate-turriculate shell, flattened or convex whorls, a high pointed spire, and a long, straightened columellar edge." (Bequaert).

Littorina scutulata Gould,1849. Kodiak Island, Alaska, south to Turtle Bay, Lower California, and Socorro Island (Dall). Type locality, Puget Sound.

Dr. W.P. Woodring comments on this species (Per. Comm.) " You may wish to add under Littorina scutulata that Carpenter thought that L. pedroana Conrad,1855 (Pleistocene,San Pedro) is L. plena. The type is lost."

Collecting data: An odd locality for this species is upper Morro Bay on salt grass stalks. There are no stones for miles and these specimens are of very exceptional size; Fauntleroy,Wash.; Crescent City,Calif.: and almost and piece of rocky rubble along the coast (Burch); Cape San Lucas, L.C. (Lowe); San Quintin Bay (Orcutt); S. Coronado Island (F. Stephens); and along the coast north to several Alaskan localities (San Diego Museum); Drier Bay, Alaska (W.J. Eyerdam).

Littorina pullata Carpenter,1864. Ann. Mag. Nat. Hist. ser.3,vol.13, p.477, June,1864. Type locality, Cape San Lucas. (This is reprinted as Paper C of the U.S. Nat. Museum 1872 reprint, Smith. Misc. Coll. No. 252). Of the holotype at the U.S. National Museum I made the following comment in my notes " Resembles L. scutulata but with incised white lines" The above comments by Dr. A. Myra Keen.

Range: Monterey south to Cape San Lucas, L.C.

Keep and Baily " West Coast Shells" state " It resembles L. scutulata but is of a dark reddish-brown color, sometimes checked with numerous finely sculptured spiral lines."

Collecting data: This color form is fairly common in some localities and not present in others semmingly of the same habitat which would indicate that it is a good race at least. It is common around La Jolla and also at Dana Point,Orange Co. It seems logical though that it should be considered a subspecies of scutulata rather than a distinct species. (Burch).; Bird Rock, San Diego (Dr. Baker); Long Beach (Baker).

Dr. A. Myra Keen comments as follows (Per. Comm.) " Littorina plena Gould,1849. Proc. Boston Soc. Nat. Hist., vol.3, p.84. Type loc., San Francisco. Carpenter lists this as a variety of L. scutulata; I doubt if it is valid even varietally. Gould says of it, " The globoseness of the last whorl is remarkable... It is.. smaller, more polished, and with a smaller aperture than L. scutulata."

Subgenus Algamorda Dall,1918. Type (by monotypy), Baludinella newcombiana Hemphill. The holotype of this species is at the California Academy of Sciences.

Littorina newcombiana (Hemphill),1876. Humboldt Bay, California. Known only from the type locality.

Keepand Baily " West Coast Shells" state of it " ... has four distinct rounded whorls. The shell is smooth, thin and covered with a brown periostracum. The aperture is nearly circular. The length is about one-fifth of an inch. This species is found in saline swamps about Humboldt Bay, and has so emancipated itself from aqueous conditions, that it is frequently found on the damp ground but above the water."

Mr. A.G. Smith comments on this species as follows: " Types in CAS along with other lots. Gordon Coll. also has a set . So far as I know, no one has collected any since Hemphill took the original lot. The shells are rather thin-textured but have the shape of a Littorina. One would expect to find them in the salt grass or in Salicornia along with Alexia setifer."

Mr. and Mrs. E.P. Chace collected the species in Humboldt Bay and had a set at a recent meeting of the club. Mr. Smith stated that they have the shape of Littorina , but to my eyes they more nearly resemble large specimens of some species of Lacuna. (Burch). There are sets in the San Diego Museum collected by Hemphill.

Littorina subrotundata Carpenter,1865. Neah Bay, Washington.

Littorina castanea Carpenter,1865. Neah Bay, Washington.

Mr. A.G. Smith comments on this species and the former as follows;" Dr. Hanna looked for those recently at Neah Bay but found only the common Littorinas there."

Family Lacunidae

Genus Lacuna Turton,1827. Type (by subsequent designation, Gray,1847), Nerita pallidula (Da Costa).

" Shell turbinated or globular, thin, covered by an epidermis; aperture semilunar, columella flattened, with a parallel groove behind it ending in the umbilicus. lip sharp, arcuated. Operculum paucispiral." (Tryon).

Grant and Gale state " It is possible that there is but one, very variable species in this genus in the California fauna." However, I cannot subscribe to this, because even if we overlook the very different shells the animal for example of porrecta moves with a different motion than some of the others at least.

However, Mr. A.G. Smith comments;" This genus to my way of thinking is in bad shape and needs careful attention by some one."

Lacuna carinata Gould,1848. Proc. Boston Soc. Nat. Hist. vol.3, p. 75, Nov. 1848. Type locality: Puget Sound. Original description follows; " Testa parva, tenuis, ovato-globosa,epidermide cornea tenui undulatim striata induta: spira anfr. 5 ventricosis, ultimo carina filosa cincto: apertura semicircularis dimidian testae adaequans; columella rotundata. Long. 3/10; lat. 1/5 poll. In color and marking much like L. vincta."

Lacuna porrecta Carpenter,1864 placed in synonymy on advice of Dr. W. P. Woodring as follows: " Lacuna carinata Gould,1848; type locality, Puget Sound. I consider L. porrecta, the type locality of which is Neah Bay at the mouth of the Strait of Juan de Fuca, a synonym. Modelia striata Gabb,1861 type locality, Santa Barbara, Pleistocene (Gabb's Miocene) is evidently L. carinata, as Carpenter thought."

Dr. A. Myra Keen remarks " As Dr. Woodring has doubtless compared the holotypes, probably his synonymy is correct."

Collecting data: Abundant on the heavy kelp around Crescent City,Calif.

and Point St. George; Fauntleroy, Wash., Puget Sound; Monterey, Calif.; San Simeon, and Cayucos; common in the Pleistocene of Timm's Point, San Pedro. As stated above this species moves with a peculiar waddling motion that seems to be different from the others. (Burch); Crescent City, Calif. (Chace); Monterey (Hemphill).

There are two subspecies of porrecta listed in Bull. 112 by Dr. Dall. Neither of these subspecies seem to have been recognized by any member of the club. They would, of course, now be subspecies of carinata is valid. They are:
Lacuna carinata effusa Carpenter, 1864. Fuca Strait to San Francisco, Calif. Type locality, Neah Bay, Wash. and
Lacuna carinata puteloides Dall, 1919 ex Carpenter MS. Lobitas, Calif.

Lacuna glacialis Moller, 1842. St. Paul Island, Pribilof Group. Also Greenland. Type locality, Greenland.

Subgenus Epheria Gray, 1847. Type (by original designation), Tyrbo vinctus Montagu.

Lacuna vincta (Montagu), 1803. Dr. A. Myra Keen advises (Per. Comm.) : Lacuna divaricata Fabricius is nomenclaturally unavailable. It may be regarded as both a homonym and a misidentification. The next available name is L. vincta (Montagu), 1803. (Test. Brit. p. 307). Type locality: Salcomb Bay, England. Original description of Turbo vinctus Montagu: " T. with a smooth conic shell, with six rounded volutions, of a subpellucid, rufous horn-colour: the lower spire marked with 4, and sometimes 5, purplish brown, or chestnut colored bands, with a broad space between the 3 lower and the upper ones; in the second and third spires are only two bands: the apex is small, but not very pointed; aperture sub-orbicular; outer lip very thin; inner lip thick, white, furnished with a narrow channel, which terminates in a small umbilicus. Length rather more than 3/8 of an inch."

Range: Norton Sound, Alaska, and south to Santa Barbara, Calif. also Pliocene. Also northern Europe and Greenland. (Dall).

Collecting data: San Lorenze Island, Alaska (Willett); Drier Bay, Knight Island, Pr. Wm. Sound, Alaska (W.J. Eyerdam); Washington (Lowe); Norway, Sweden, England (Anderson) (San Diego Museum).

Lacuna solidula Loven, 1846. Skuyak Strait, Afognak Island, Alaska (Eyerdam) south to San Diego, Calif. Also Atlantic.

The description of this species was omited from Oldroyd, and Dr. A. Myra Keen has sent it to us. It follows: " Lacuna solidula, 1846. Ofversigt af Kongl. Vetenskaps-Akaremiens Forhhandlingar for 1846(1847), vol.3, no.5, p.155. Type locality: Bergen-Finmark. Original description; " T. oblongo-ovata, solidula, fusca, anfr. convexis, labro patulo, acuto, callo interne incrassato, aport. antico effusa; 9/5.5 mm" (Apparently the dimensions are 9 mm. in height by 5.5. in diameter.)

Grant and Gale consider this a synonym of the preceeding species following Tryon in Man. of Conch.

Collecting data: Departure Bay, Vancouver Island, B.C. (A.F. Tissot); Mole Harbor, Alaska (Kate Stephens); Washington (Lowe).

Lacuna variegata Carpenter, 1864. Puget Sound s uth to Santa Monica Bay (Keen). Type locality, Neah Bay, Washington.

Collecting data: Monterey, Calif. on algae (Burch); Point Vicente (Lowe); Cayucos, Calif. (Lowe).

Lacuna unifasciata Carpenter, 1856. Monterey, Calif. south to Magdalena Bay, L.C. Type locality, Santa Barbara, Calif.

Collecting data: This is by far the most common species of the genus in our experience and easily collected in great numbers from algae on shore as well as from the floating off shore kelp. Plentiful in the eel grass and in the eel grass roots. A few stations follow: Monterey, San Simeon, Cayucos, Santa Monica, Redondo Beach, Malaga Cove, Catalina Island, Dana Point, San Onofre, La Jolla, Mission Bay, and Todos Santos Bay (Burch); Reef Point and Isthmus Cove, Catalina Island) Strong); Elkhorn Slough, on broad leaved eel-grass; scarce (A.G. Smith); La Jolla (Chaney); San Pedro and Cayucos (Lowe); Lower Calif. (Hemphill) (San Diego Museum).

Lacuna unifasciata aurantiaca Carpenter, 1864. Santa Barbara, Calif. to Point Abreojos, L.C. Type locality: San Pedro-San Diego and Santa Barbara Island.

" Keel obsolete"

Collecting data: San Diego and Catalina Island (Lowe); La Jolla (Bristol); San Diego (Hemphill).

Lacuna marmorata Dall, 1919. Saginaw Bay, Alaska to San Diego, Calif. Type locality, Monterey, Calif.

Collecting data: Our experience has been to find this species living on the stones littoral, unlike the above species which seems to be always confined to a habitat on some kind of algae. I have seen stones covered with these shells so that it was possible to simply brush them off into a pail. However, there are a few odd notes on it. We collected several specimens from the back of a large Haliotis rufescens brought up by divers off Cayucos, Calif. from about 35 ft,. A few localities follow: De Poe Bay, Oregon; Crescent City; Point St. George; Morro Rock; Cayucos. (Burch); abundant at low tide on eel grass in Monterey Bay (A.G. Smith); Holm Bay and Mole Harbor, Alaska (Kate Stephens); Washington (Lowe); Monterey (Lowe).

Lacuna olla Dall, 1919. Dall, #2295, Proc. U.S.N.M., v.56, 1919, p.349. Described as a variety of marmorata.

Subgenus Bootica Dall, 1918. Type (by orig. desig.) Bootica vaginata Dall. The one species placed under this subgenus does not seem to have been figured U.S.N.M. vol.56, p.349.

Lacuna vaginata Dall, 1918. Santa Rosa Island in 53 fms. and OFF La Jolla in 199 fathoms. Type locality, off La Jolla.

Genus Haloconcha Dall, 1886. Type (by monotypy): " Lacunella" reflexa Dall. New name for subgenus Lacunella Deshayes. " Shell depressed, heliciform, few-whorled, thin, with a strong epidermis; margin of the aperture thin, with a narrow reflexed margin in the adult, continuous with the thin sharp, unreflected arcuate columella; umbilicated, operculum paucispiral" (Dall).

Haloconcha reflexa Dall, 1884. Probilof Islands. Type Loc.-St. Paul Island.

Haloconcha minor Dall, 1919. Commander, Pribilof and Aleutian Islands eastward to Chirikoff Island, Alaska (Dall).

Type locality: English Bay, St. Paul Island, Pribilof Group, Bering Sea.

Genus Aquilonaria Dall, 1886. Type, Aquilonaria turneri Dall.

Shell lioplaciform, more or less membranous, thin, imperforate, without sculpture, but with a rough, transversely shaggy epidermis. Operculum subspiral with a raised subspiral rib on the inner side." (Dall).

Aquilonaria turneri Dall,1886. Arctic Ocean near Bering Strait. Also Labrador. Type locality, Labrador's Reef, Ungava Bay.

Family Fossaridae

Genus Fossarus Philippi,1840. Type (by monotypy), Fossarus adansonii Philippi = Turbo ambiguus Linnaeus. Recent, Senegal. Fide Woodring,1928.

" Shell perforated, sculptured; inner lip thin; aperture semilunate. Operculum not spiral. " (Tryon).

Fossarus parcipictus Carpenter,1864. Todos Santos Bay,L.C. to Panama.

Mr. Strong lists records of this species from Mazatlan,Mex. etc.

Fossarus angiolus Dall,1919. Todos Santos Bay.

It seems very doubtful if there are any California records for either of the above species.

Genus Iselica Dall,1918. Type (by monotypy), Isapis anomala C.B. Adams.

" Shell umbilicated, spire elevated, cancellated or with revolving ribs, columella with a small median tooth (almost obsolete in F. anomala) (Tryon).

to Nicaragua (Lowe).
Iselica fenestrata (Carpenter),1864. Puget Sound to/the Gulf of California.
Type locality, Santa Barbara Islands and San Diego.

Collecting data: We have this species from Puget Sound to Todos Santos Bay, L.C. Perhaps the easiest way to collect is to examine almost any Mytilus bed. The wharf pilings at least all along the southern California coast will produce any number of them. However, the bathymetric range is also of some interest. We have it dredged in Puget Sound. It was not uncommon in the dredgings off Monterey down to below 20 fms. and it was rather a common species in the dredgings off Redondo Beach, Calif. in the gravel beds at 25 fms. or slightly deeper. Abundant in some of the Pleistocene deposits suchas Hilltop Quarry at San Pedro. (Burch); San Diego (Anderson); Laguna Beach (Lowe); San Pedro (Lowe); San Juan del Sur, Nicaragua (Lowe).

Iselica obtusa (Carpenter),1864. Puget Sound to San Diego.
Type locality, San Diego, Calif. in 10 fms.

Collecting data: Dredged off Redondo Beach, Calif. in 25 fms. gravel. (Burch); San Diego, Calif. in 5 fms. (Hemphill); San Diego in 15 fms.(Lowe); Mission Beach (Chaney) (San Diego Museum).

Iselica obtusa laxa Dall,1919. Vancouver Island, B.C. to Puget Sound, Wash.
Type locality, Maple Bay, Vancouver Island, B.C.

Additions and Corrections

Lacuna solidula Loven , (Page 14, this issue). Mr. A.G. Smith comments on this species as follows: " Not sure of this identification but refer large specimens found on the beach at Point Pinos to this species. Have also taken it on the Mendocino Co. coast. Believe Chace has it from Crescent City."

The following keys and lists are from Mr. A.M. Strong's notebook.

Family Fossaridae

Genus Iselica

Columella with a small median tooth
• Body whorl with seven rounded spiral ribs
•• Shell pale, rosy, shining
6 x 4 mm. Monterey to San Diego .... obtusa
• Body whorl with nine sharp spiral ribs
•• Shell light yellowish brown
6 x 6 mm. Puget Sound to Gulf of Calif. .... fenestrata
• Body whorl with eight strong, equal spiral cords
•• Shell grayish white
1.5 x 1.2 mm. Bahia Honda, Panama .... kochi
• Body whorl with ten strong subquadrate spiral ribs
•• Shell white, maculated with purplish brown
3 x 3 mm. Gulf of California .... maculosa
• Body whorl with eleven flat, smooth spiral ribs.
•• Shell white, solid
8 x 3.5 mm. Gulf of California .... ovoidea
Columella smooth .... Genus Fossarus

Genus Fossarus Philippi, 1840.

Principal sculpture of from 4 to 6 spiral keels
• Spaces between the ~~wherls-~~ keels smooth
•• Periphery of body whorl angulated
4 x 5 mm. Panama .... foveatus
•• Periphery of body whorl rounded
••• Spire with 2, body whorl with 6 strong cords
2.25 x 1.75 mm. Todos Santos Bay ....angiolus
••• Spiral cords irregular, fading out on body whorl
2.5 x 2.25 mm. Panama .... abjectus
• Spaces between the keels spirally threaded
•• 2 keels on the periphery, 2 on the base
1.5 x 2.5 mm. Cape San Lucas .... lucasana
•• 4 keels on body whorl, 2 usually most prominent
••• Nuclear whorls 2
•••• Nuclear whorls smooth
1.75 x 1.5 mm. Mazatlan .... angulatus
•••• Nuclear whorls finely cancellated
2.0 x 2.0 mm. Cape San Lucas .... purus
••• Nuclear whorls 4, tuberous, cancellated
1.0 x 0.9 mm. Mazatlan .... tuberosus
•• 6 keels on the body whorl
••• Keels regularly spaces
•••• Shell subglobose, white maculated with brown
6 x 5 mm. Cape San Lucas ....parcipictus
•••• Shell obliquely ellipsoid, pale horn and brown
4 x 3 mm. Panama .... excavatus
••• With a wide, flat space between the suture and 1st keel
3.25 x 2.5 mm. Panama .... angiostomus
• Spaces between the keels axially threaded
•• Whorls angular, shell dingy white
2.25 x 2.25 mm. Panama ....megastomus
•• Whorls convex, shell chestnut
2.6 x mm. Panama .... medioeris

(con.)

.. Shell helicoid, white
3.7 x 4.1 mm. Ecuador .... guayaquilensis

Genus Iselica Dall,1918.

Iselica fenestrata Carpenter,1864	Puget Sound to Gulf of California
Iselica obtusa Carpenter,1864.	Monterey to San Pedro
Iselica maculosa Carpenter,1857.	Gulf of California
Iselica ovoidea Gould,1856	Gulf of Calif.
Iselica kochi Strong and Hertlein	Bahia Honda,Panama

Genus Fossarus Philippi,1840.

Fossarus angiolus Dall,1919.	Todos Santos Bay
Fossarus lucanus Dall	Cape San Lucas
Fossarus tuberosus Carpenter,1857	Mazatlan
Fossarus angulatus Carpenter,1857	Mazatlan
Fossarus parcipictus Carpenter,1864.	Todos Santos Bay to Panama
Fossarus purus Carpenter,1864.	Magdalena Bay to Cape San Lucas
Fossarus atrata C.B. Adams,1852	Panama (abjecta)
Fossarus angiostoma C.B. Adams,1852	Panama
Fossarus excavatus C.B. Adams,1852	Panama
Fossarus foveata C.B. Adams,1852	Panama
Fossarus megasoma C.B. Adams,1852	Panama
Fossarus guayaquilensis Bartsch,1928	Ecuador

Additions and Corrections

We have the following note from Dr. A. Myra Keen " Some time ago I gave you a reference which you quoted, to Buccinum striatissimum, a Japanese species which Stanford has from Bering Sea and Lynn Canal, I now have the original description at hand:

Buccinum striatissimum G.B. Sowerby,III. (Ann. Mag. Nat. Hist. ser.7, vol. 4, no.23 (Nov. 1899), p. 370, text-figure 1). " Testa ovato-conica,crassa, albida, epidermide pallida tenuissime induta,spiraliter striata; spira elongato-conica,acutiuscula; anfractus circiter 8-9, valide convexi,rotundati, sutura impressa sejuncti,spiraliter densissime inciso-striati,striis eximie undulatis; anfractus untimus supra tumidus,infra leviter contractus; apertura subovalis, alba, canali lato, brevissimo; columella antice rectiuscula, postice obliqua, in medio arcuata, callo crasso induta; labrum crassum, leviter reflexum , postice laevissime sinuatum. Operculum typicum. Long. 115, diam. 65; aperture longa 40, lata 26 mm."

Type locality: Kumihama, Tango,Japan. " This fine species is a typical Buccinum, but does not exhibit any of the longitudinal plicae characteristic of B. undatum. The whorls are peculiarly rounded and swollen, while somewhat depressed at the suture. The whole surface of the shell is closely and regularly sculptured with fine waved grooves."

The following interesting note from Dr. A.M. Keen:

" Yesterday I ran across something Dr. Dall and others including me, had overlooked-- that Carpenter had described Ocenebra interfossa var. atropurpurea The reference is: Proc. Acad. Nat. Sci. Phila. for 1865 (Aug.7,1865), p.64: " Costis spiralibus distantibus, in spira duabus, foveis majoribus. Variat. quoque t. albido zonata." The type locality is Puget Sound. This is going to interest Mrs. Bormann.

Family Litiopidae

Mr. A.M. Strong in his notebook makes the following comments on this group.

The three genera placed in the family are very different in shell characters, but presumably similar in habitat, i.e. pelagic, living on floating sea weed.

Litiopa is definitely stated as living on floating sea weed. The single species reported from the west coast, L. bombyx Rang, is listed by Tryon as a synonym of L. melanostoma Rang for which he gives a world wide distribution.

Alaba is more or less varicose and in a large series some specimens are almost all covered with varicose swellings and others scarcely show any signs of swellings. Bartsch, in some cases, seems to make specific characters of the lack of varices. All the specimens I have seen,they were taken at almost every dredging station containing small shells from all expeditions, were dead shells which had dropped to the floor of the ocean if they were pelagic as seems to be the case. These shells were more or less bleached and would have lost epidermal colors if such had been present. However,some species have been separated on whatI take to be epiermal colors. I have listed the species as described, but I very much doubt if there is really more than one real species.

The two west coast species placed in the genus Eumete are quite distinct. They are known by very few specimens and as far as I can find out dredged as dead shells. They could easily be pelagic though the shape would not indicate it. The genus may be better known elsewhere.

There seems to be considerable difference of opinion as to the type and definition of the genus Alaba. Woodring probably is correct. I do not know how to treat Carpenter's descriptionand notes in Maz. Cat. His description of nuclear whorls seems to be different from Bartsch 's. I have followed Bartsch in leaving out the various species described by Carpenter. In addition to the reasons given by him the variation of the specimens we have examined is so great that no such close division could be made.

Genus Litiopa Rang,1829.	
Litiopa bombyx Rang,1829.	Southern Calif. to Gulf of Calif.
Genus Alaba A. Adams,1862	
Alaba joanettae Bartsch,1910.	San Pedro to Acapulco
Alaba catalinensis Bartsch,1920.	Catalina Island
Alaba supralirata Carpenter,1856	Gulf of Calif. to Panama
Alaba interruptelineata Pilsbry & Lowe,1932	San Juan del Sur
Alaba guayaquilensis Bartsch,1928.	Ecuador
Genus Eumete	
Eumete bimarginata C.B. Adams,1852	Gulf of Calif. to Panama
Eumete intercalaria Carpenter,1865	Gulf of Calif. to Guacomo
Eumete eucosmia Bartsch,1911	Galapagos

Family Litiopidae

The genera placed under this family by Dr. Dall in Bulletin 112 have been the source of no little disagreement. Thiele places Diala,Alaba and Litiopa under the family Cerithiidae, subfamily Litiopinae. While there seems to be some question about Diala in the arrangement, it seems that most authors are using the family Litiopidae for these genera.

However, the genus Barleeia is placed under Litiopidae by Dr. Dall with a ?. Thiele places Barleeia in the family Rissoidae, subfamily Barleeinae. Thiele seems to be disposed to use large family groups. It is probable that the genera Barleeia and Diala should be placed in a separate family. It seems to me that the genera of this group differ materially in shell charac-

-ters and may very well be separated further unless perhaps they are related anatomically.

Dr. A. Myra Keen comments " I should advise being conservative in the matter of family names and letting the specialists decide whether new ones are needed. In this case, better follow Thiele, since he has positive ideas and Dr. Dall had only a question mark."

Grant and Gale,1931 place Diala and Barleeia in a family together using the family name ?.

Dr. Joshua L. Baily Jr. comments (Per. Comm.) " In reply to the questions on the bunch of papers beginning with Litiopidae, I would say that there is so much difference of opinion among malacologists as to the first four genera Litiopa,Diala,Alaba,and Barleeia that almost any arrangement is likely to meet with the approval of somebody. My personal preference is different from any of your suggestions, so I shall not complicate matters by giving it to you. I will only say that some years ago I went over the question of Litiopa bombyx versus Litiopa melanostoma and decided in favor of L. melanostoma. Dr. Pilsbry and I went over it together. I forgot why.

If you make Barleeia the type os a family, its name ought to be Barleeiidae but the multiplicity of vowels in the middle of this word is likely to make the spelling you suggest more popular."

The family name suggested was Barleeidae.

Genus Litiopa Rang,1829. Type (?) Litiopa bombyx Rang. Mr. A.M. Strong notes " The single species reported from the west coast is listed by Tryon as a synonym of L. melanostoma Rang for which he gives a worldwide distribution." However, I notice that other authors reverse the proceedure placing melanostoma in the synonymy of bombyx.

" Shell minute, conoidal, columella truncated at the base, outer lip simple, notched." (Tryon).

Litiopa bombyx Rang,1829. Southern California and Gulf of California. Pelagic. (L. melanostoma Rang.)

Mr. A.M. Strong has a note on this in his notebook as follows:" Oldroyd gives this as the type of the genus but copies the description of melanostoma rang,1829 given by Tryon as having wordwide distribution and including this species. How can the type of a genus be a synonym of another species described at the same time by the same author ?"

Dr. A.M. Keen advises " For discussion of Litiopa see Palmer, Nautilus v.55, no.4, pp. 128-130 and vol. 58, no.2,p. 70 (in the latter Rang,1929 should obviously be Rang,1829). The only specimens from the west coast which we have obtained I took from beach drift at Punta Penasco,Mexico. Dr. Schenck sent a number of what appear to be the same thing (though I suppose an expert might find differences) from Oro Bay, New Guinea; they were lodged in the crevices of floating Spirula shells and were alive when collected. The species was omited from my check list because I could not translate such a vague range into terms of latitude."

Genus Alaba A. Adams,1862. Type (by subsequent designation,Nevill, 1885), Alaba melanura (C.B. Adams) (Rissoa melanura C.B. Adams). Fide Woodring,1938, p.340.

" Shell elongate-conic,semitransparent, usually with irregularly spaced hollow,varicose swellings. The nucleus consists of about 4 sculptured whorls which continue the general outline of the spire with scarcely any interruption. The aperture is rather large, oval, outer lip thin, the basal lip curving into the columella without a notch or canal."

Alaba jeanettae Bartsch,1910. San Pedro, Calif. to Gulf of California (Dall). Type locality, Margarita Bay, Lower Calif. /to Acapulco (Strong).

Collecting data: Espiritu Santo Island, Gulf of Calif. and Magdalena Bay, L.C. (Dr. F. Baker)

Alaba catalinensis Bartsch,1920. Catalina Island, Calif. Known only from the type locality. Mr. A.M. Strong comments on this species " The nuclear whorls are not described and no mention is made of spiral sculpture which is present on other species. However, it is stated that the whorls are marked by fihe, retractively slanting lines of growth. Otherwise, the shell would seem to be very similar to Alaba supralirata Carpenter."

None of the members seem to have recognized it locally.

Alaba sp. Reported from Carmel Bay in 25 fms. by Mr. A.G. Smith.

Family Barleeiidae

Genus Barleeia Clark,1856 Type (by monotypy), Barleeia rubra (Montagu). " Shell broadly conic or ovate, with about two microscopically thimble pitted nuclear whorls forming a blunt apex. Postnuclear whorls three or fout, smooth or with microscopic striations. Aperture oval, posterior angle obtuse, outer lip thin, basal lip curving evenly to the junction with the inner lip, body covered with a callus. Shell not umbilicated." (Strong).

See the discussions on pages 19 and 20 and also Mr. Strong's comments on the following page for our conclusion to place all species formerly listed under Diala under the genus Barleeia. However, for the convenience of those who will not agree with this practice the data on the genus Diala follows: Genus Diala A. Adams,1861. Type (by subsequent designation, Dall,1922), Diala varia A. Adams. " Whorls not varicose, sometimes nodulated around the middle; columella straightish not truncated; labrum not thickened." (Tryon).

Barleeia acuta (Carpenter),1864. Puget Sound to San Martin Island (Baker) to San Hipolito (Jordan). Type locality, Catalina Island.

Collecting data: See Mr. Strong's note on p. 23. Dredged off Monterey, Calif. in 15 fms.; off Avalon, Catalina Island in 25 fms.; not uncommon in the Pleistocene of Hilltop Quarry, San Pedro (Burch); Monterey Bay, shore to 20 fms. (A.G. Smith); Monterey (Lowe);

Barleeia exilis (Tryon),1866. San Francisco Bay to San Diego Bay.(Dall). Type locality, San Diego. None of the members seem to have recognized this species. Barleeia exilis (Tryon).

Barleeia marmorea (Carpenter),1864. Queen Charlotte Islands, B.C. south to San Martin Island, L.C. (Baker). Dr. A. Myra Keen advises " Type locality os Barleeia marmorea according to the holotype label at the U.S.N.M. is San Pedro." This species was listed by Dr. Dall in Bull. 112 as Diala. In Nautilus 35:84,85 1922 Dr. Dall made the following statements:" The shell listed by Carpenter as Diala marmorea though shaped and colored like some of Adams Dialas does not belong to the genus. It has the operculum and radula of Barleeia but differs in having a smooth nucleus while that of Barleeia rubra is thimble-pitted. The rhachidian tooth of marmorea is more squarish than t that of B. rubra as figured by Troschel and has five rounded cusps, the middle one larger...."

Collecting data: Littoral on algae at Monterey,Calif. and picked up in the dredge down to as deep as 15 fms; from backs of Haliotis rufescens from 35 ft. off Cayucos,Calif. (Burch); Monterey (Hemphill and Lowe); So. Coronado Id.(Baker); Monterey Bay to 25 fms. (A.G. Smith);Queen Charlotte Island (T.S. Oldroyd). * Continued on Page 24*

Genus Barleeia

The following comments on this group are from Mr. A.M. Strong's notebook.

" Dall puts this genus in family ?, and I have no record of any recent writer suggesting a family name. The genus probably belongs in a family by itself. None of the early writers mention the most characteristic generic thing common to all species, the thimble pitting of the nuclear whorls. This is lacking in the other species lumped by the older writers under Rissoa.

In the absence of sculpture it is hard to put into words the distinguishing characters of the various species and still harder to pick out the key characters. Bartsch makes one of his main divisions on periphery subangulated and periphery rounded. I have never been able to see this distinction in examining the shells. Much depends on the age and angle at which you look at the shell. I have tried to use other characters in my key but doubt if it will work out any better. I expect the color and presence or absence of color bands does not mean anything.

Bartsch makes no mention in his paper of the three west coast species that Carpenter described as Diala, tho he has said in letters that they are probably only large species of Barleeia. They are no larger than his B. dalli and in fact are very difficult to separate from it. I think that acuta Cpr. and marmorea Cpr. should be included in Barleeia. They show the thimble pitting of the nucleus very distinctly. We have never figured out what Diala exilis Tryon is.

Carpenter's Diala acuta and marmorea and Barleeia subtenuis and haliotiphila all date from the Suppl. Report,1865, but are fully described in later publications. For acuta Carpenter gives the locality as Monterey and Catalina. Oldroyd gives the type locality as Catalina. For marmorea Carpenter gives Monterey and San Diego. Oldroyd gives the type locality Monterey. For subtenuis Carpenter gives Catalina and San Diego. Oldroyd gives type locality San Diego. For haliotiphila Carpenter gives locality unknown,probably Lower California.

Bartsch, in the text, states that the specimen for B. subtenuis Cpr. comes from San Diego and is a typical specimen. In the Explanation to Plates he gives it as B. subtenuis, type. This of course is not correct. The same thing applies to B. alderi Cpr. and B. haliotiphila Cpr. The figures are not of the types and the specimens do not come from the type localities. Should this be correct and if so how ?"

Genus Barleeia

Periphery of last whorl angulated
. Peripheral angle marked with a raised thread
.. Shell more than 4 mm. in length .... dalli Bartsch
.. Shell less than 3 mm. in length .... bentleyi Bartsch
. Peripheral angle not marked by a raised cord
.. Shell more than 4 mm. in length
... Base flattened, almost truncate .... acuta Carpenter
... Base flattly sloping .... marmorea Carpenter
.. Shell less than 3 mm. in length .... zeteki Strong & Hertlein
Periphery of last whorl not angulated
. Shell unicolor
.. Shell broadly conic
... Shell 3 mm. or more in length .... subtenuis Carpenter
... Shell less than 2 mm. in length ....coronadoensis Bartsch
.. Shell not broadly conic
... Shell 2.5 mm. or more in length
.... Aperture comparatively small .... haliotiphila Carpenter

(con.)

.... Aperture comparatively large .... oldroydi Bartsch
... Shell less than 2 mm. in length .... carpenteri Bartsch
. Shell banded
.. Whorls strongly inflated ....polychroma de Folin
.. Whorls not strongly inflated
... Aperture comparatively large ....californica Bartsch
... Aperture not comparatively large
.... Whorls narrowly shouldered at the summit.... orcutti Bartsch
.... Whorls almost appressed at the summit ...... alderi Bartsch

Genus Barleeia Clark,1855. Type (by original designation) (Barleeia) rubra Montagu. Recent, British Isles

Shell broadly conic or ovate, with about two microscopically thimble pitted nuclear whorls forming a blunt apex. Postnuclear whorls three or four, smooth or with microscopic striations. Aperture oval, posterior angle obtuse, outer lip thin, basal lip curving evenly to the junction with the inner lip, body covered with a callus. Shell not umbilicated.

Barleeia acuta (Carpenter),1864. Monterey to San Martin Island,L.C. Shell waxy, polished, shining, with an angulated periphery. The species differs from Barleeia marmorea (Carpenter) in being slightly smaller and with a sharper angulation at the periphery, and from Barleeia dalli Bartsch ,which is about the same size, in the lack of the raised thread at the peripheral angle.

Barleeia alderi (Carpenter),1856 Gulf of California to Tres Marias Islands, Mexico.(Carpenter's listing from San Diego undoubtedly refers to one of the species later described by Bartsch). Type locality, Mazatlan.

Shell elongate ovate with a well rounded periphery and a small aperture. The distinct color banding described by Bartsch is a variable character, faint or absent in some specimens.

Barleeia bentleyi Bartsch,1920. Venice,Calif. to Cape San Lucas,L.C. Type locality, Venice, Calif.

This species resembles Barleeia dalli Bartsch in the raised cord on the angulated periphery but is much smaller and usually darker in color.

Barleeia californica Bartsch,1920. San Pedro, Calif. to Point Abreojos,Mex . Type locality, San Pedro,Calif. This is one of the smallest of the west coast species. The periphery is slightly angulated, the aperture comparatively large, and the brownish color is more or less distinctly banded.

Barleeia carpenteri Bartsch,1920. Off Newport Beach,Calif. to Cape San Lucas Mexico. Type locality, Cape San Lucas. This is a very small, elongate ovate shell with a well rounded periphery. The upper whorls are narrowly shouldered at the summit and the color is given as white. (I have specimens dredged off Newport that were so identified by Bartsch and have extended the range accordingly. I have an idea that the white color is due to bleaching. My specimens are dead but look fairly fresh.)

Barleeia coronadoensis Bartsch,1920. San Pedro, Calif. to Point Abreojos, L.C. Type locality, Off Coronado Islands,L.C.,Mex. in 7-10 fms. This species is similar to Barleeia subtenuis (Carpenter) in the oval shape. The periphery is well rounded and the whorls are rounded and appressed at the summit . It is the smallest of the west coast species and the color is said to be white.

Barleeia dalli Bartsch,1920. Off Point Loma,Calif. in 71-75 fms. This is one of the largest of the west coast species. The periphery is strongly angulated and marked by a raised cord. The color is said to be yellowish white.

Barleeia haliotiphila Carpenter,1864. Mendocino Co.,Calif. to Point Abreojos, L.C. Elongate conic with the periphery slightly angulated. The aperture is rather small compared with other species in the genus and the color is pale chestnut brown.

(con.)

Barleeia marmorea (Carpenter),1864. Queen Charlotte Islands, B.C. to Lower California. Type locality ?. The shell is similar to Barleeia dalli Bartsch but the strongly angulated periphery is marked by a raised thread or cord. The shell is whitish, more or less clouded with faint chestnut axial lines. (I think that Grant and Gale's reference to Baker,San Martin Island is either an error or a missidentification. Acuta is the southern form and marmorea the northern tho Carpenter separated them in Southern California. I am not sure that they are distinct.)

Barleeia oldroydi Bartsch,1920. Mink Bay,Vancouver Island,B.C. to Coronado Islands,L.C. Type locality, Monterey,Calif. This is a rather slender shell with the periphery obsoletely angulated. The aperture is larger than that of B. haliotiphila which is about the same size and also unicolor.

Barleeia orcutti Bartsch,1920. Magdalena Bay,L.C. to Monserrate Island, Gulf of Calif. Type locality, Magdalena Bay, L.C. Shell very small, rather broad, with the periphery well rounded and very narrowly shouldered at the summit. In the type the posterior half of the whorls are diffused with pale brown and the anterior half is white.

Barleeia polychroma (de Folin),1870. Bay of Panama. The whorls are inflated and the periphery obscurely angulated. The colors are variable, with indistinct color bands.

Barleeia subtenuis Carpenter,1864. San Francisco,Calif. to Gulf of Calif. Type locality ? The species is distinguished from the other west coast species in the genus by the large size and broader proportions. Often there is a slight umbilical chink behind the columella.

Barleeia zeteki Strong and Hertlein,1939. Bahia Honda to Taboga Island, Panama. This species has the periphery slightly angulated but without a raised thread. The whorls are only moderately rounded and the apwrture is large and flaring.

* Continued from bottom of Page 21*

Barleeia haliotiphila Carpenter,1864. Mendocino Co., Calif. to Lower Calif. Dr. A.M. Keen advises " Type locality of B. haliotiphila is " probably Lower Calif., from the back of a Haliotis splendens" (i.e. H. fulgens)."

Collecting data: Arbolitos, Lower Calif. (Burch); Santo Tomas,L.C. (Hemphill); Laguna Beach (Lowe); San Pedro (Lowe); San Clemente Island and Monterey (Lowe) (San Diego Museum); 5-15 fms. off Pt. Pinos; also kelp holdfasts. Does not appear to be a shore form in Monterey Bay. (A.G. Smith); Mink Bay, B.C. (T.S. Oldroyd) (A.G. Smith).

Barleeia sanjuanensis Bartsch,1920. Shuyak Strait, Afognak Island, Alaska (Eyerdam,1924) on nullipora under rocks to Puget Sound.
Type locality, Gulf of Georgia, Puget Sound.

Collecting data: Elrington Island, Pr. Wm. Sound, Alaska (Eyerdam); Washington (Lowe);

Barleeia subtenuis Bartsch,1920. San Pedro to San Ignacio Lagoon, L.C. to San Martin Island (Baker). Type locality, according to Dr. A.M. Keen was not selected and stands -Sandiego; Santa Barbara Islands.

Collecting data: New port Bay, Calif.; very abundant in Mission Bay, San Diego Co. on eel grass; the Estero below Ensenada,L.C. (Burch); Brackish spring at Carmel (J.G. Cooper). Have not found it in the Monterey region (A.G. Smith); San Diego Bay (T.S. Oldroyd) (A. Smith); Catalina Island (Lowe); San Diego (Hemphill, Lowe and Cleveland); San Diego Bay (Dr. F. Baker); Sah Martin Island (Dr. F. Baker).

Barleeia subtenuis rimata Carpenter,1864. San Diego ,Calif. Dr. Bartsch in Proc. USNM vol.58,p.169,1920 places this in the synonymy of the typical. No one seems to have recognized it as distinct.

Barleeia coronadoensis Bartsch,1920. Off Coronado Island in 7 to 10 fms.

Barleeia dalli Bartsch,1920. Off Point Loma, Calif. in 75 fms.
Collecting data: There is a set in the San Diego Museum of Natural History from the Dr. F. Baker collection labelled as from Pt. Pinos, Monterey Co. This should probably be checked.

Barleeia bentleyi Bartsch,1920. Venice, Calif.
Collecting data: Venice, Calif. (Dr. W. Gregg); Venice,Calif. on bryozoa (Lowe and Baker) (San Diego Museum).

Barleeia oldroydi Bartsch,1920. Mink Bay, Vancouver Island, B.C. south to Coronado Islands. Type locality, Monterey, Calif.
Collecting data: Very abundant littorala at Monterey,Calif. on algae and brought up in the dredged down to perhaps 15 fms. off both Monterey and Pacific Grove; from the backs of Haliotis rufescens brought up by divers off Morro Bay, Calif.; Bird Rock, San Diego Co.; Pleistocene of Timm's Pt., San Pedro (Burch); the abundant shore form in the Monterey region. Also kelp holdfasts. (A.G. Smith);

Barleeia californica Bartsch,1920. Oakland, San Francisco Bay (M. Gordon) south to Point Abreojos, L.C. Type locality, Crocker's Wharf, San Pedro.
Collecting data: San Pedro (Lowe); (See description on p. 23).

Barleeia alderi (Carpenter),1856 . Reef Point, Orange Co. south to Tres Marias Islands. Type locality, Mazatlan, Mexico.
Se discission on p. 23.
Collecting data: Reef Point, Orange Co.; La Jolla, San Diego Co. (A.G. Smith); San Diego (T.S. Oldroyd).

Genus Anabathron Fruenfeld,1867. Reise der osterreichischen Fregatte "Novara".. Zool. vol.2-III, Moll., p. 13. Type (fide Suter,1913): Rissoa contabulata Fruenfeld. Suter gives this description: " Shell very small, oblong, thick, smooth, scalariform, with a carinated shoulder,imperforate; aperture rounded; peristome continuous."

Anabathron muriei Bartsch and Rehder, Nautilus, vol. 52, no.4, April,1939, p. 110, pl.8, figs. 2,2a. Type locality: Ogliuga I., Aleutians.
See page 34 for description.

Family Rissoidae

Genus Skeneopsis Iredale,1915. Dr. A. Myra Keen advises on this genus as follows: " Skeneopsis Iredale,1915. Proc. Malac. Soc. vol. II, p. 292 . Type (by original designation), Turbo planorbis Fabricius. This is Skenea of authors, though not of Fleming .
" Shell orbicular, spiral, depressed and discoidal, deeply umbilicated, few-whorled; peritreme circular, continuous, entire." (H. & A. Adams.)

Skeneopsis alaskana Dall,1919. Pribilof and Unalaska Islands, Alaska. Type locality, St. Paul Island, Bering Sea.
Collecting data: Saltwater Lake, Amaknak Id., Aleutians (T.S. Oldroyd) (A.G. Smith).

Genus Amphithalamus Carpenter,1865. Type (by original designation), Amphithalamus inclusus Carpenter. Distribution, California to Japan-Panama.

" Shell minute, broadly conic to elongate ovate, smooth except for a cord or faint spiral thread on the periphery. The nucleus is large, of about 1½ whorls and is finely pitted as in Barleeia. The most striking character is a shelly bridge separating the inner lip from the open umbilicus." (Strong).

Periphery rounded, without definite marking .... lacunatus Carpenter
Periphery marked by a cord or fine spiral thread
. Periphery with a faint spiral thread
.. Shell elongate ovate .... tenuis Bartsch
.. Shell broadly ovate ....stephensae Bartsch
. Periphery with a distinct spiral cord
.. Shell elongate ovate ....trosti Strong & Hertlein
.. Shell broadly ovate ....inclusus Carpenter
(The above key from Mr. A.M. Strong's notebook).

Amphithalamus inclusus Carpenter,1865. San Pedro and Catalina Island , to the Gulf of California. Type locality, San Diego, Calif. fide Bartsch

Collecting data: No. Coronado Island (Simmons); So. Coronado Island (Lowe); Avalon Bay, Catalina Island (Strong).

Amphithalamus lacunatus Carpenter,1866. San Pedro,Calif. to San Diego. Type locality, San Pedro, Calif.

Amphithalamus tenuis Bartsch,1911. Monterey, Calif. south to Guadelupe Island, Lower Calif. Type locality, La Jolla, Calif.

Collecting data: No. Coronado Island (Simmons); also (Stephens); San Diego (Lowe); La Jolla (Stephens); Monterey Bay, shore to 10 fms.; Catalina Island, 30-70 fms.(M. Gordon); San Diego (M. Gordon).

Genus Cingula Fleming,1818. Type (by tautonymy), Rissoa cingillis (Montfort) (Turbo cingillia Montfort).

" Shell minute, white or horny; conical, pointed, many-whorled; smooth, or cancellated; aperture rounded; peristome entire, continuous; outer lip slightly expanded and thickened; operculum sub-spiral." (Woodward).

Cingula eyerdami Willett,1934. Nautilus 47:103,104, pl.8, fig.9,1934

" Shell elongate-ovate, grayish, except for the nuclear whorls, which are dirty white. Whorls rounded, appressed at the summit. Sutre strongly constricted. Base well rounded, narrowly umbilicated. Aperture rounded anteriorly, angled posteriorly. Post-nuclear whorls and base smooth to the naked eye, but under a strong lens show very faint spiral striations."

" ..The type has five whorls, and measures in millimetres: Length,2.3; diam. 1.2. Paratypes in the collection of A.M. Strong and the writer.

Range: Shuyak Strait, Afognak Island, Alaska (Eyerdam, Nautilus 57:142) to Evans Island, Pr. Wm. Sound. Type locality, Evans Island, Pr. Wm. Snd.

Collecting data: among nullipores on rocks at low tide (Eyerdam);

Cingula forresterensis Willett,1934. Nautilus 47:103,104, pl.8, 1934 Type locality, Forrester Island, Alaska and known only from type locality.

" Shell elongate-conic, white. Post-nuclear whorls appressed at the summit, moderately rounded, finely spirally striated. Last whorl elongated, with very narrow umbilical chink. Aperture rounded anteriorly, angled posteriorly."

" ... The type measured in millimeters: Length 3, diam. 1.2." This species is the most slender of west American Cingulas so far described.

Cingula martyni Dall,1886. Bering Strait to the Aleutians and eastward to Chignik Bay, Alaska (Dall). Type locality, Kyska Harbor,Aleutians.

Collecting data: Illuliuk Bay, Unalaska Island, Aleutians, dredged, (W.J. Eyerdam); Akutan Island (I. Norberg) (Eyerdam); Korovia Bay,Alaska; Elrington Island, Alaska (T.S. Oldroyd)

Cingula martyni scipio Dall,1886. Pribilof Islands to the Aleutians and eastward to Middleton Island, Alaska (Dall) Type locality, Kyska Harbor, Aleutian Islands.

Collecting data: Dutch Harbor,Aleutian Islands (W.J. Eyerdam).

Cingula alaskana Bartsch,1912. Amchitka Island, Aleutians.

Collecting data: Shuyak Strait, Afognak Island, Alaska,1924 (Eyerdam).

Cingula katherinae Bartsch,1912. Windfall Harbor, Admiralty Island, Alaska. to Queen Charlotte Ids.,B.C. (Victoria Museum) (Eyerdam).

Cingula aleutica Dall,1886. Pribiloff Islands to the Aleutians and eastward to Windfall Harbor,Admiralty Island, Alaska. (Dall). Type locality, Unalaska.

Collecting data: Shuyak Strait, Afognak Island, Alaska on bread sponges; Elrington Island, Pr. Wm. Sound, Alaska (Eyerdam); Elrington Island,Alaska (T.S. Oldroyd).

Cingula montereyensis Bartsch,1912. Moss Beach, Calif. to Monterey. Type locality, Monterey.

Collecting data: Moss Beach (Voorhees) (Stanford Univ. Coll.); 5 to 15 fms. off Pt. Pinos (A.G. Smith).

Cingula californica (Tryon),1865. San Francisco Bay to San Pedro,Calif. Type locality, Oakland and Monterey, Calif.

Cingula orvieta Dall,1919. San Diego, Calif.

Subgenus Nodulus Monterosato,1878. Type (fide Cossmann), Rissoa contorta Jeffreys.

"* In Nodulus we find a very characteristic oblique aperture; axial ribs are never present and spiral sculpture, if at all present, is reduced to exceedingly fine striations." (Bartsch,1911).

* Two references for this group are: Bartsch, Paul " The West American Mollusks of the Genus Cingula", Proc. U.S.N.M., no. 1871, vol.41, pp 485-488, pl.41,1912, and Bartsch, Paul " The West American Mollusks of the Genus Nodulus", Proc. U.S.N.M. no. 1858, vol.41, pp. 289-291, 1911.

Bartsch in his 1911 paper considered Nodulus a genus, but Dall in Bull. 112 followed by Mrs. Oldroyd and others have used it as a subgenus. The differences seem to be slight, and until further advised we propose to use it as a subgenus.

However, Mr. A.M. Strong comments on it as follows " The shells as figured and described by Bartsch are slender or subcylindrical while the shells of Cingula are ovate to subglobose. All the known species of Nodulus are Alaskan with one exception. I think it would be well to follow Bartsch. However, it seems out of place to put the shallow water southern species in the same genus with the Alaskan species."

to Shuyak Strait (Eyerdam).

Cingula cerinella Dall,1886. Kyska and Amchitka/Islands, Alaska, and Atka Id. Type locality, Atka Island, Alaska.

Collecting data: Shuyak Strait, Afognak Island, Alaska, 1924, on nullipores- Extended Range about 1500 miles eastward from Atka Island (W.J. Eyerdam);

Cingula asser Bartsch,1910. Atka Island, Aleutians to Cook's Inlet.
Type locality, Port Graham, Alaska.

Cingula kelseyi Bartsch,1911. San Diego south to Pt. Abreojos (Jordan).
Type locality, Coronado Island, San Diego, Calif.

Collecting data: San Diego (Lowe Collection); Pt. Abreojos,L.C. (T.S. Oldroyd) (A.G. Smith).

Cingula kyskensis Bartsch,1911. Kyska and Atka Islands, Aleutians to Shuyak *Strait, Afognak Island*,Alaska on nullipores (Eyerdam). Type locality, Kyska Harbor, Aleutians.

Collecting data: Mr. Eyerdam's record above is an extended range of about 1600 miles eastward from Kyska Island.

Cingula palmeri Dall,1919. Pribilof Islands, Bering Sea.
Type locality: St. Paul Island, Bering Sea.

Genus *Alvania* (Leach) Risso,1826. Type (by subsequent designation, M. Gordon, *Nautilus* 53:29,1939), *Alvania freminvillea* Risso = *Turbo cimex* Linnaeus.

This genus has been revised by a number of different authors. A few of the papers follow:
Gordon, McKenzie Jr., Nautilus 53:29,33 " A New Subgenus and Species of West Coast Alvania." 1939.
Bartsch, Paul, " The Recent and fossil mollusks of the genus Alvania from the west coast of America.", Proc. U.S.N.M. vol.41, pp. 333-362, pls. 29-32.

In this paper Dr. Bartsch gives a key to species. Mr. A.M. Strong's key will follow this discussion.

" Shell oval, turbiniform; spire short, apex sharp; whorls rounded, usually cancellated; aperture subcircular, crenulated within; outer lip with a marginal exterior varix." (Tryon).

However, Mr. Gordon in his paper cited above makes the following statements

" The true Alvanias of the Mediterranean region differ from our West Coast forms in the following particulars:
(1) They have heavy thick shells about 5 mm. in height while the latter have rather delicate shells generally less than 3 mm. in height.
(2) They possess five postnuclear whorls while our West Coast forms generally average three.
(3). The outer lip of the former is greatly thickened by a prominent buttress-like varix and its interior bears prominent denticles, while the West Coast forms have a thin to slightly thickened outer lip with the interior generally smooth but occasionally with shallow spiral lirations.
(4) The sculpture of the shells of true *Alvania* is also coarser and heavier than that of the West Coast species.

Subgenus *Willettia* Gordon,1939. Nautilus 53:31 . Type (by original designation), *Alvania montereyensis* Bartsch,1911.

" This *subgenus is characterized* principally by a turbinate, well-rounded nucleus of approximately two whorls which is sculptured by spiral lirations. The shell is not thick and generally less than 3 mm. in height. The post-nuclear whorls are generally three in number and somewhat inflated or well rounded. The shell is sculptured by spiral cords on the whorls and base and axial ribs on the whorls. The intersection of the ribs and cords form nodes. The aperture is rissoid with the outer lip thin to slightly thickened and smooth within. The peritreme is complete."

* See Page 30 for the continuation of this discussion.*

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Genus *Alvania* (Leach) Risso,1826.

The following key is from Mr. A.M. Strong's notebook.

Spiral sculpture distinctly stronger than the axial
. Spiral sculpture of incised lines San Bartolome Bay .. *bartolomensis*
. Spiral sculpture of raised cords
.. Axial sculpture of threads between the cords Cape San Lucas. *albolirata*
.. Axial sculpture of broad,subobsolete ribs Gulf of Calif.... *lirata*
Spiral sculpture not distinctly stronger than the axial
. Junction of the axial ribs and spiral cords nodulose
.. Sutures channeled
... Spiral cords on penultimate whorl 2
.... Basal cords 3 Lower Calif. .... *cosmia* Bartsch
.... Basal cords 4 Lower Calif. .... *purpurea* Dall
... Spiral cords on penultimate whorl more than 2
.... Spiral cords on penultimate whorl 3
..... Cords equal in strength Galapagos .... *halia* Bartsch
..... Cord at summit weaker Galapagos .... *ima* Bartsch
.... Spiral cords on penultimate whorl more than 3
..... All spiral cords equal
...... Axial ribs strongly protractive Clarion Island ... *clarionensis*
...... Axial ribs nearly vertical Tres Marias Islands.. *granti* Strong
..... Spiral cords unequal
...... Nodes compressed, sharp edged Galapagos .... *lara* Bartsch
...... Nodes rounded Panama ....*valerionia*
.. Sutures not channeled
... Shell elongate conic
.... Nodes cusp like Gulf of Calif. ....*effusa*
.... Nodes rounded, not cusp like
..... Axial ribs on penultimate whorl 16-18
...... Whorls slopingly shouldered Lower Calif. ..... *aequisculpta*
...... Whorls not shouldered Cape San Lucas .... *herrerae*
..... Axial ribs on penultimate whorl 20 or more
...... Whorls slopingly shouldered Cape San Lucas ..... ~~gallegosi~~ *lucasana*
...... Whorls not shouldered Cape San Lucas ....*gallegosi*
... Shell ovate or subglobose
.... Shell strongly umbilicated Lower Calif. ....*oldroydae*
.... Shell narrowly umbilicated or imperforated
..... Base with 2 spiral cords Gulf of Calif. .... *tumida*
..... Base with 4 spiral cords Gulf of Calif. .....*monserratensis*
Spiral sculpture not distinctly stronger than the axial
. Junction of spiral cords and axial ribs not nodulous
.. Sutures strongly channeled Gulf of Calif. .... *excurvata*
.. Sutures not channeled
... Spiral sculpture on penultimate whorl less than 10
.... Shell elongate conic Cape San Lucas .... *electrina*
.... Shell ovate
..... Base with 4 spiral cords Central America ......*perlata* Morch
..... Base with more than 4 spiral cords
...... Axial ribs on penultimate whorl 14 Galapagos .... *nemo* Bartsch
...... Axial ribs on penultimate whorl 20 Galapagos .... *galapagensis*
... Spiral cords on penultimate whorl 10 or more
.... Shell elongate conic Galapagos ....*hoodensis*
.... Shell ovate
..... Axial ribs on penultimate whorl 32 Galapagos ... *profundicola*

Genus Alvania Risso,1826 Type, Rissoa abyssicola Forbes

" Shell small, broadly ovate to elongate conic, sculpture with spiral cords or axial ribs or both. Aperture subcircular, without notch or canal, outer lip in the adult thickened externally, usually with a raised varix. Umbilicus closed, body with a strong callus." (Strong).

Alvania carpenteri Weinkauff,1885. Forrester Island to Lower Calif.
Alvania purpurea Dall,1872. Monterey to San Martin Island.
Alvania acutilirata Carpenter,1866. Monterey to San Martin Island
Alvania aequisculpta Keep,1887. Catalina to Todos Santos Bay
Alvania cosmia Bartsch,1912. San Pedro to San Martin Island
Alvania oldroydae Bartsch,1912. San Pedro to Guadalupe Island
Alvania almo Bartsch,1912. Santa Barbara Island to Reef Point
Alvania rosana Bartsch,1912. Santa Rosa and Catalina Islands
Alvania bartolomensis Bartsch,1917. San Bartolome Bay
Alvania albolirata Carpenter,1864 Cape San Lucas
Alvania electrina Carpenter,1864 Cape San Lucas
Alvania tumida Carpenter,1856 Cape San Lucas
Alvania lucasana B. H. and S.,1930 Cape San Lucas
Alvania contrersi Jordan Pleistocene , Magdalena Bay
Alvania keenae Gordon Moss Beach
Alvania herrerae B. H. and S.,1930 Cape San Lucas
Alvania gallegosi B. H. and S.,1930 Cape San Lucas
Alvania monserratensis B. H. and S.,1930 Gulf of Calif.
Alvania effusa Carpenter,1856 Gulf of Calif.
Alvania lirata Carpenter,1856 Gulf of Calif.
Alvania excurvata Carpenter,1856 Gulf of Calif.
Alvania clarionensis Bartsch,1912. Clarion Island
Alvania perlata Morch,1868 Central America
Alvania granti Strong Tres Marias Islands
Alvania profundicola Bartsch,1912. Galapagos
Alvania hoodensis Bartsch,1912 Galapagos
Alvania galapagensis Bartsch,1912. Galapagos
Alvania nemo Bartsch,1912 Galapagos
Alvania halia Bartsch,1912. Galapagos
Alvania ima Bartsch,1912 Galapagos
Alvania lara Bartsch Galapagos
Alvania peruviana D'Orbigny Peru
Alvania valeronis Strong and Hertlein Panama
Alvania bicolor Bartsch Galapagos (MS?)
Alvania duncani Bartsch Galapagos (MS?)

* Continued from bottom of Page 28*

Alvania keenae Gordon,1939. Nautilus 53:31,32, pl.7, figs. 7,9 (left). Type locality, Moss Beach, San Mateo Co., Calif. and apparently known only from the type locality.

" Shell small, elongate-ovate, yellowish-white. Nuclear whorls one and one half, turbinate, with axis parallel to that of the post-nuclear turns; first nuclear half-turn smooth (eroded?); last turn sculptured by approximately ten rounded, hardly elevated, somewhat beaded spiral lirae, separated by v very narrow spiral grooves. Post nuclear whorls well rounded, almost inflated, marked by narrow, rounded, elevated, slightly protractive axial ribs, about one third to one fourth as wide as the spaces that separate them. Of these, 18 occur on the first, 22 on the second, and 25 on the third (last) turn.

(con.)

The axial ribs are corssed by prominent, elevated, well rounded spiral cords which are stronger than the axial ribs; separated by slightly wider, broadly rounded spiral grooves. There are five spiral cords on the first two whorls and six on the last, the extra cord being added below the periphery by the coiling of the shell. The two posterior cords are narrower and more closely spaced than the rest which are subequal in strength and spacing. This results in a slight angulation at the third cord in the second whorl, but not in the last whorl where the second cord becomes slightly stronger. The axial ribs are strongest where they cross the spiral cords, forming prominent eliptical nodes with the long axis parallel to the spiral cords. The axial ribs are not well developed on the last half-turn. The sutures are rather strongly constr--icted.

Periphery well rounded, marked by a sulcus not quite as wide as that separating the heavier cords on the spire. Base rounded, narrowly umbilicated, with a slight angulation marking the boundary of the umbilical area. The base is sculptured by six (not counting the first sub-peripheral cord which is exposed on the last whorl) low, rounded, closely-spaced spiral cords, much weaker than those on the spire; the last one occupying the umbilical area. The base is also marked by faint lines and constrictions of growth. Aperture oval; posterior angle obtuse; outer lip very slightly thickened, well-rounded; inner lip rounded, slightly reflexed and appressed to the base posteriorly; parietal wall covered with a moderately thick callus which renders the peritreme com--plete. The type posses three and one quarter whorls and measures: length,1.9; diameter,1.0. "

Holotype: No. 6516 (Stanford Univ. type coll.).

Alvania keenae appears to be most closely related to A. montereyensis Bartsch which possesses eight spiral threads on the nuclear whorls and has similar sculpture. The new species, however, differs from A. montereyensis in having more spiral cords on all the whorls, less axial ribs in the early whorls, and weaker spiral cords on the base, besides a more robust shape."

Alvania montereyensis Bartsch,1911. Sitka,Alaska south to Cayucos (Strong). Type locality, Monterey, Calif.

Collecting data: Monterey Bay and vicinity, low tide under rocks; 11 mi. N. of Ft. Bragg ; 3 miles south of Cayucos (A.G. Smith); Cayucos (Lowe)

Alvania microglypta Haas,1943. Zoological Series of Field Museum of Natural History, vol. 29, no.1, pp. 2-4, fig.1. Type locality, Point Pinos, Monterey Peninsula, Calif. washed from sand in a tide pool. Known only from the type locality.

" Shell elongate, conic, creamy white, solid, minute, with four and one--half rather rapidly increasing whorls. Nuclear whorls about one and one half, voluminous, globular, smooth (fig.1,c), with the apex sunk below the level of the last half. Post-nuclear whorls three, spirally keeled, separated by a distinct, though by no means very deep suture. Three rather obtuse keels are present on the first post-nuclear whorl, which become more defined on the second whorl, and which assume almost fantastic features on the last post--nuclear whorl, where nodular excressences are developing on them and where secondary keels intercalate between the original ones or originate below the lowest one. The whorls are rather slender, not swollen, distinctly shouldered, the upper keel forming the angle of the shoulder. Down to the first post--nuclear whorl there is no trace of axial sculpture, but, starting on the second, axial grooves are seen which regularly intersect the space between the suture and the upper keel, carving this into two ridges and furrows of about equal length; the furrows correspond to the axial grooves of the space above

(con.)

the keel. The middle and the lower keels on the second postnuclear whorl show only indistinct traces of such crossing of an axial sculpture. Finally, on the last post-nuclear whorl, the cutting of the keels into knobs is not traceable to axial sculpture, but has become quite irregular; while the marginal knobs of the middle and the lowe keels are moderately small and homogeneous, those on the upper keel- by far the thickest of the three- are irregular as to shape and size (fig. 1,a,b). In an alagous way the space between the upper keel and the suture is irregularly beset with nodules, the furrows between which correspond to those dividing the knobs of the upper keel. The aperture is oval, doubly liped, showing the external spiral sculpture weakly within; the inner lip is thin, smooth, much appressed, and the outer one is thicker, showing the keels at its outer margin. No umbilical chink is discernable. Base of the shell rather flat, smooth and shiny." Measurements.- Height 0.97 mm., width 0.6 mm., height of aperture 0.41 mm.

Diagnosis- A very minute species of the rissoid genus Alvania , subgenus Willettia, characterized by its extreme smallness, by a wide, subglobular nucleus of one and one half whorls, by a solid shell strongly spirally keeled and by having only the slightest indications of intersecting axial sculpture.

Comparisons- The new form cannot be easily compared to any other known species, since it combines features thought to be characteristic of the subgenus Willettia with features to be found in other West Coast species, e.g. in A. bakeri Bartsch; these points will be discussed below.

Alvania sanjuanensis Bartsch,1920. Drier Bay, Knight Island, Pr. Wm. Sound, Alaska,1923 (Eyerdam) south to San Juan Islands, Gulf of Georgia.
Type locality, San Juan Islands, Gulf of Georgia.

Collecting data: Mr. Eyerdam's record listed above is an extension of the range northward some 1500 miles; Washington (Lowe Coll.); Seattle (Gordon)

Alvania aequisculpta Keep,1887. Pacific Grove, Monterey Bay (A.G. Smith) south to Cape San Lucas, Lower Calif. Type locality, San Diego, Calif.

Collecting data: Dredged off Redondo Beach, Calif. in 25 fms. gravel; El Morro Point, north of Ensenada,L.C.; Punta Banda on Todos Santos Bay,L.C.; Arbolitos,L.C.; White's Point,L.A. Co.; dredged off Monterey Bay in 15 fms. (Burch); Catalina Island in 30 to 70 fms.(Gordon); San Diego (T.S. Oldroyd); beach drift at Pacific Grove (A.G. Smith); Avalon, shore and from 5 mi. S. of Laguna (A.G. Smith); San Pedro (Baldridge); Todos Santos Bay (Hemphill); Pacific Beach (Kelseyand Stephens); San Diego (Baker and Kelsey); La Jolla (Chaney) (San Diego Museum).

Alvania cosmia Bartsch,1911. Santa Barbara Islands south to San Martin Island, L.C. Type locality, San Pedro, Calif.

Collecting data: San Martin Island, L.C. (Dr. F. Baker); So. Coronado Isl. ('Baker); Pt. Vincent, L.A. Co. (Strong); La Jolla (Chaney); San Pedro (Lowe); Reef Pt.,Orange Co. in 12 fms. (T.S. Oldroyd); San Diego (T.S. Oldroyd); 5 mi. S. of Laguna Beach and also White's Point, L.A. Co. (A.G. Smith).

Alvania kyskaensis Bartsch,1917. Kyska Harbor, Aleutians.

Gordon stated that in addition to the above A. halia and A. nemo Bartsch from the Galapagos are in the subgenus Willettia. The remaining species are questionably Alvania s.s. Therefore, we will simply list them without attempt at subgeneric classification.

Alvania castanella Dall,1886. Kyska to Atka Island, Aleutians.
Type locality, Atka Island, Alaska.

Alvania dalli Bartsch,1927. Proc. U.S.N.M., vol.70, p.30, pl.3, fig.6,1927. Type locality, Shuyak Strait, Afognak Island, Alaska.
Collecting data: Collected from type locality by W.J. Eyerdam on nullipores.

Alvania aurivillii Dall,1886. Kyska to Adakh Island, Aleutians. Type locality, Adakh Island, Alaska.

Alvania bakeri Bartsch,1910. Port Graham, Cook's Inlet, Alaska.

Alvania trachisma Bartsch,1911. Monterey, Calif.

Alvania californica Bartsch,1911. Mendocino Co., Calif. (A.G. Smith) south to Redondo Beach, Calif. (Burch). Type locality, Monterey.
Collecting data: Dredged off Redondo Beach, Calif. in 25 fms. gravel. (Burch); have not collected this at Monterey; one set cf. californica from Russian Gulch, Mendocino Co., Calif. (A.G. Smith).

Alvania carpenteri Weinkauff,1885. (New name for A. reticulata Carpenter, preoccupied). Drier Bay, Knight Island, Prince Wm. Sound, Alaska (Eyerdam) to Monterey, Calif. Type locality, Neah Bay, Wash.
Collecting data: Mr. Eyerdams record extended the range northward from Forrester Island, Alaska. ; Monterey, Calif. (Oldroyd) (San Diego Museum of Natural History.) ; Puget Sound (T.S. Oldroyd); Elrington Island(Oldroyd).

Alvania pedroana Bartsch,1911. Redondo Beach (Burch) to Mission Bay. Described from the Pleistocene of San Pedro, Calif. and questionably Recent. However, I have a set labelled cf. pedroana which must be close to it, but dredged from over 100 fathoms off Redondo Beach on mud bottom. (Burch). a set so identified in the San Diego Museum of Natural History from Mission Bay collected by Stephens.

Alvania filosa Carpenter,1865. Vancouver Island, B.C. (Taylor) and Neah Bay, Wash. north to Hoonah, Alaska (Mrs. Kate Stephens). Type locality, Neah Bay.
Collecting data: Mrs. Stephens set extending the range northward to Alaska is in the San Diego Museum of Natural History.

Alvania alaskana Dall,1886. Nunivak Island, Bering Sea to Shuyak Strait, Afognak Island, Alaska (Eyerdam). Type locality, Nunivak Island.
Collecting data: Elrington Island (T.S. Oldroyd); Windfall Harbor, Alaska (T.S. Oldroyd).

Alvania rosana Bartsch,1911. Monterey Bay (Gordon) south to Catalina Island Calif. Type locality, off Santa Rosa Island, Calif.
Collecting data: Dredged in 25 fms. off Avalon, Catalina Island; off Redondo Beach, Calif. in 25 fms. gravel and also in 75 fms. rock and gravel. (Burch); Catalina Island in 35 fms. (Lowe); Catalina Island in 30 fms. (Baker); Carmel Bay in 25 fms. (C.A.S.); common with A. acutelirata off Catalina (C.A.S.); Catalina in 30 fms. (T.S. Oldroyd) (A.G. Smith).

Alvania iliuliukensis Bartsch,1911. Iliuliuk Harbor,Unalaska to Belkoffski, Alaska. Type locality: off Iliuliuk Harbor, Alaska.

Alvania dinora Bartsch,1917. Forrester Island, Alaska.

Alvania compacta Carpenter,1864. Port Etches, Alaska to San Diego, Calif. Type locality: Vancouver Island, B.C.

Collecting data: Dredged off Monterey, Calif. in 15 fms.; off Redondo Beach, Calif. in 25 fms. gravel; Pleistocene of Hilltop Quarry, San Pedro, (Burch); off Friday Harbor, Puget Sound (T. Kincaid); Drier Bay, Knight Island, Alaska in 1923 (W.J. Eyerdam); Crescent City,Calif. (Chace); Washington (Lowe); Windfall Harbor, Alaska (Mrs. Kate Stephens); Monterey Bay in 15 fms. (Gordon); Puget Sound and Olga, Puget Sound, also Trinidad, Calif. (T.S. Oldroyd).

Alvania acutelirata Carpenter,1866. Monterey, Calif. south to San Martin Island, L.C. Type locality, San Diego. Type at U.C. The original spelling was with an "e" instead of an "i" as usually spelled.

Collecting data: Dredged off Redondo Beach, Calif. in 25 fms. and also to 100 fms.; from backs of Haliotis rufescens brought up from about 35 ft. off Morro Bay; Cayucos,Calif. littoral; Pleistocene of Timm's Piint,San Pedro (Burch); dredged off S. Coronado Id. in 18 fms. (Dr. F. Baker); San Diego (Lowe); Monterey Bay in 5 to 30 fms., also San Diego (T.S. Oldroyd); 3 mi N. of Cayucos (A.G. Smith).

Alvania purpurea Dall,1871. Monterey south to San Martin Island, L.C. Type locality, Monterey.

Collecting data: Monterey, Calif. from algae close to shore; dredged off Monterey in 15 fms.; Punta Banda, on Todos Santos Bay, littoral; (Burch); dredged off S. Coronado Island in 18 fms. (Dr. F. Baker); San Diego, Calif. (T.S. Oldroyd); La Jolla (Chaney); Monterey Bay on rocks at low tide to 30 fms.; Reef Point, Orange Co. (A.G. Smith).

Alvania almo Bartsch,1911. Santa Barbara Island, Calif. to Orange Co.

Collecting data: Reef Point in 10 fms. (Strong).

Alvania oldroydae Bartsch,1911. Monterey Bay, Calif. (Gordon) south to Guadalupe and San Martin Islands, L.C. Type locality, Sam Pedro

Collecting data: White's Point, L.A. Co. (E.V. Edmonds); dredged off S. Coronado Island (Dr. F. Baker); La Jolla (Chaney); Ocean Beach (Simmons); beach drift at Pacific Grove (Gordon); Reef Point (Orange Co.(A.G. Smith).

Alvania burrardensis Bartsch,1921. Proc. Biol. Soc. Wash. 34:38. Type locality, Burred Inlet, British Columbia. Known only from type locality.

Additions and Corrections

Continued- from page 25 this issue- original description of Anabathron muriel Bartsch and Rehder,1939. Nautilus 52:110,111,1939, pl.8, fig. 2,2a.

" Shell very minute, elongate conic, thin, semi-translucent, white. The nucleus consists of a single, somewhat inflated, well rounded turn which is slightly obliquely placed. The 2.75 postnuclear whorls bear a strong spiral keel on the middle of the turns. There is a second keel on the middle of the base and a third that bounds the edge of the funnel-shaped umbilicus. In addition to this, the entire surface of the shell is marked by very fine spiral lirations and axial incremental threads, which show as a fine reticulation when seen under high magnification. The umbilicus is broadly expanded and marked by incremental lines and the fine spiral lirations mentioned for the spire. Aperture broadly oval, almost subcmrcular; peristome slightly thickened. The last whorl is slightly solute."

The type, USNM no. 535345, was obtained from the droppings of a sea otter at Ogliuga Id.,Aleutian Ids. It measures: Length 0.8 mm,diam.0.4 mm.

Additions and Corrections

Mr. Henry Dodge, 6 Rochambeau Road, Scarsdale, N.Y.

I notice in the last Minutes that Dr. Keen cites Murex argus Linne as the type, by original designation, of Argobuccinum Klein in Hermannsen 1846. Argus, as a specific name, was only used once by Linnaeus and that was for his Cypraea argus. Grant and Gale make the same error. I immagine that Hermannsen must have designated Murex argus Gmelin (for a long time placed in Ranella or Bursa) although Hermannsen's work is not available here. I will check it when I next go to Boston or Washington. At any rate Murex argus is not Linne, but Gmelin. Possibly the error started as far back as Hermannsen.

I have been spending some time on a catalogue of the Linnean species and their present-day representatives and have come across many errors where species of later authors are improperly attributed to Linnaeus. Some of them are Lamarck's species and here the trouble was caused by transcribing a handwritten " Lam." into " Linn.". I have caught myself doing the same thing myself, as my handwriting is extremely bad. Others are Gmelin's species and th there the mistake possibly arose because Gmelin's work was published as the 13th. Edition of the Systema Naturae, and, for some utterly ridiculous reason writers felt that his species, unknown to Linnaeus, must be given as " Linne". It is possible that Hermannsen made this mistake. I will be interested to check back.

Your Minutes continue to improve in interest and scholarship, and you are doing a grand, workmanlike job, and deserve a lot of credit. I have not been much interested in western Pacific species as I should be as I have been confining myself to Linnaean shells lately, and they are pretty infrequent in your part of the world. However, I am still planning to come to California soon and when I do I hope to learn something about them..."

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Southward Extension of Range of Pediculariella californica (Newcomb).

A short time ago we were sent a fine set of the above species by Mr. and Mrs. E.W. Cameron, Box 644, San Pedro, Calif. They were collected by Mr. H. Jacobs, a friend of theirs who is a deep sea diver. This is an extension of range southward from Monterey and a correction of our data as oublished in Minutes #53, page 25.

We are indebted to Dr. Fritz Haas of the Chicago Natural History Museum who obviously received some of the same lot, for the overlooked generic name, Pediculariella Thiele,1925. The letter from Dr. Haas follows.

" I want to communicate to you some facts concerning a not too common Californian shell which only last week came into our Museum's possession.

We were presented with a rather fine specimen of what is generally called the coral, but what really is a Hydrocoralline , a beautifully pink specimen of Millepora. Among the rather interesting animal association to be found on this Millepora, there were about a dozen shells of what in the " Minutes", No. 53, p.25 were called Pedicularia californica Newcomb. The longest specimen was 10.25 mm. and all of them were rather of variable shape, according to the place where they had settled on the Millepora. Those sitting on the flat side of the stems were much broader than those attached to the rather narrow edges. Their color was in general way exactly that of the Millepora, only occasionally interrupted by a white belt at the circumference. The exact data accompanying the find are: 2 miles off the west side of Catalina Island, 150 feet deep.

I thought that this information might interest you or any member of your conchological club, whose Minutes always give me the highest pleasure.

I want to call your attention, by the way, to the fact that Thiele, in 1925 had separated Pedicularia californica from typical Pedicularia on account of obvious differences in the mouth parts, and that he erected for it the new genus Pediculariella, and that Schilder (Fossilium Catalogus, Pt. 55,1932) adopted this name."

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It is of further interest to mention that the diver mentioned in the above article has also produced numbers of other exceedingly rare and beautiful shells. Mr. Jacobs has obtained a number of perfect living specimens of Tegula regina (Stearns),1892. This beautiful species is of almost legendary rarity.

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The following collecting data was received from Mr. W.J. Eyerdam after we had typed the report. These records will supplement those published in Minutes #54 as wellas the first part of this issue.

Bittium eschrichtii Middendorff,1849.- Port Orchard,Kitsap Co.; Alki Point, Seattle, King Co.; Port Ludlow, Jefferson Co. and many other localities on Puget Sound, Wash. also Drier Bay, Knight Island, Alaska. Extension of geographic range northward from Sitka.

Bittium (Semibittium) vancouverensis Dall and Bartsch,1910 . Izhut Bay, Afognak Island, Alaska,1945- on bread sponges under rocks- always scarce- Extension of geographic range northward from Barklay Sound, Vancouver Id.

Bittium (Lirobittium) munitum Carpenter,1864. Victoria, B.C.

Trichotropsis bicarinata Sowerby,1825. St. Lawrence Island, Bering Sea.

Trichotropsis costellata Couthouy,1839. Trichotropsis borealis Sowerby,1829. Drier Bay, Knight Island,1923; Izhut Bay, Afognak Island,1922; Red Fox Bay, Shuyak Strait,1924; Sitkalidak Id.,1931; Dutch Harbor, Aleutian Islands,1932; and Raspberry Id., Alaska,1945; (Eyerdam); Hinchinbrook Id., Pr. Wm. Snd., Alaska (I. Norberg).

Trichotropsis cancellata Hinds,1843. Strait of Juande Fuca,Wash.; Izhut Bay, Afognak Id.,; Drier Bay, Knight Island,; and Sitkalidak Id.,Alaska- dredged.

Trichotropsis insignis Middendorff,1849. Izhut Bay, Afognak Island; Sitkalidak Id.,Alaska; and Dutch Harbor, Aleutian Islands under stones.

Micranellum oregonense Bartsch,1922. Drier Bay, Knight Id., Pr. Wm. Sound, Alaska- dredged.

Fartulum occidentale Bartsch,1920. Under stones at low tide- Drier Bay, Knight Island, Extension of geologic range northward from Gulf of Georgia about 2,000 miles.

Bivonia compacta Carpenter,1864. Rosario Beach, Skagit Co., Wash.

Aletes centiquadratus Valencien es,1846. Corinto,Nicaragua,1939.

Tachyrhynchus erosus Couthouy,1833. Smith's Cove, Seattle, Wash. in 10 fms.

Tachyrhynchus erosus major Dall,1919. Drier Bay, Knight Island, a nd Izhut Bay; Afognak Island, Alaska- dredged.

Tachyrhynchus lacteolus Carpenter,1865. Drier Bay, Knight Island- dredged.

Littorina squalida Broderip & Sowerby,1829. Petropavlovsk, Avatcha Bay, Kamchatka, on rocks at extreme low tide- occurs in isolated small colonies- a large heavy coarse shelled species about the size of Littorina littorea L.

Littorina sitchana Philippi,1846. Many colonies on Puget Sound and Wash. co coast; also Drier Bay, Knight Id.,; Izhut Bay, Sfognak Id.; Sitkalidak id; Kodiak Id.; Raspberry Id.; King Cove, Alaska peninsula; Unimak Id; Dutch Harbor; Unalaska Id.; Atka Id., Alaska and Aleutian Islands; also Vladivostock,Siberia 1928 and Tsuruga,Japan,1930. This is a very common and variable species. There are a number of forms and banded or color varieties which, however, need not be named. It is possible that the Vladivostock shells could be a good subspecies.

Littorina atkana Dall,1886. This seems to be a rather rare species. I found only two specimens on Atka Island, the type locality, and none on any of the other Aleutian Islands visited.

Littorina aleutica Dall,1873. Atka Island- rare.

Littorina groenlandica Menke,1830. Godthaab,Greenland, the type locality.

(con.)

Littorina rudis Donovan,1800. Port Orchard, Kitsap Co. and Rosario Beach, Skagit Co., Wash.; Drier Bay, Izhut Bay, Sitkalidak Id., and all Aleutians visited; also Gulf of Kronotski, Kamchatka,1925 and Port Arthur, Manchuria, 1928- also in exchange from New England,England,France,Sweeden,Norway,White Sea, and Russia.

Littorina planaxis Philippi,1847. Port Orchard, Kitsap Co., and Alki Pt. Seattle, Wash.- not common in this area.

Littorina (Melarhaphe) scutulata Gould,1869. Nearly everywhere on rocks near high tide mark in Puget Sound. Izhut Baym Afognak Id., Drier Bay, Knight Id., Raspberry Id., Alaska. Does not seem to be common in Alaska. * Note* The specimens that I have collected this summer on Raspberry Strait, Raspberry Island are mostly black, and without the mottled patterns of the Puget Sound shells. They are also more slender and are not common. This one perhaps merits a subspecific name.

Lacuna porrecta Carpenter,1864. Port Orchard, Kitsap Co., Alki Pt., Seattle and Rosario Beach, Skagit Co., Wash. on eel grass.

Lacuna divaricata Fabricius,1780. Drier Bay,Mallard Bay and Thum Bay, Knight Island, Three Saints Bay, Kodiak Id., Izhut Bay, Afognak Id., and Raspberry Id., Alaska- on eel grass.

Lacuna carinata Gould- This is the name given to about ten lots of Alaskan shells submitted to Dr. S.S. Berry for identification about 4 years ago under the name Lacuna divaricata. Which name is correct? * L. carinata*

Lacuna variegata Carpenter,1864- Puget Sound.

Lacuna solidula Loven,1846. In a shallow lagoon- Red Fox Bay, Shuyak Strait, Afognak Island- on Fucus in countless thousands, 1931.

New Publications

Schenck, Hubert G. and Keen, A. Myra " Biometrical Analysis of Molluscan Assemblages", Societe De Biogeographie- Contribution A L'Etude de la Repartition Actuelle Et Passee Des Organismes dans La Zone Neritique, Paris, 1940- 14 pages and 2 plates.

Schenck,Hubert G.- " Geologic Application of Biometrical Analysis of Molluscan Assemblages", Journal of Paleontology, vol. 19, no.5, September, 1945. 20 pages 2 plates.

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William G. Fargo , 506 Union St.,Jackson, Michigan is again spending the winter at his Florida address, P.O. Box 874, Pass-a-Grille.

Leslie Hubricht, 63 Longfellow St., Detroit 2, Michigan. This is his new address.

Marshall Sohl Jr., 1433 W. 134th St., Gardena, Calif. We are happy to welcome Mr. Sohl as one of our subscribers and sincerely hope that he will be able to attend some of the meetings.

Captain C.M. Dumbauld, (MC), USN, Medical Officer in Command, U.S. Naval Hospital, Balboa, Canal Zone. " I recently saw a copy of the Minutes of the Conchological Club of Southern California in the office of Dr. James Zetek. I wonder if it would be possible for me to be placed on the mailing list for this pamphlet. Could you also tell me if back issues are available and how obtained." We will be happy to mail Captain Dumbauld all available back issues of our paper.

Mrs. W.V. Hadfield, Private Bag, Takaka, New Zealand. " I have posted you a small parcel of shells, some of which I hope will prove new to you. We cannot send money out of the country, so I hope you will accept this as some slight token of appreciation of your kindness in sending me your club notes. These have been coming regularly and have been much enjoyed. " Thank you- and the editor should add that he has received many fine and rare shells through exchange with Mrs. Hadfield and had perhaps belatedly here mention receipt of a nice box early in the war.

Minutes of the Conchological Club of Southern California- Dec. meeting

The Conchological Club of Southern California met at their new location in the Junior Museum Lecture room, which is located on the ground floor in the S.E. corner of the Junior Museum Building.

The meeting was held Tuesday evening, Dec. 4, 1945, and was called to order by the president, Dr. W.O. Gregg. It being a rainy night but eleven members were present.

Due to the fact that New Year's day falls on the regular meeting day in January, it was voted , that for that occasion only, the meeting be held one weel later, Jan. 8,1946.

There were no reports by standing committees. The minutes of the previous meeting were approved.

Due to the fact that there had been no regular meeting in November, the president appointed as Nominating Committee for next year's officers, the following: E.P. Chace, Dr. Chas. Wright, and A.M. Strong. Their recommendations for officers were: President- Dr. Wendell O. Gregg; Vice President- Dr. Charles R. Wright; and Secretary-Treasurer- Mrs. Effie M. Clark. Nomination was made and carried that the report be accepted and those named be declared duly elected.

Dr. Gregg appointed the following committees:
Nomenclature- A.M. Strong, Mrs. E.P. Chace, and J.Q. Burch
Membership- Morris Caruthers, Charles R. Wright, and E.P. Baker
Program- Dr. H.R. Hill, W.G. Rador, and another to be added later.
Editor- J.Q. Burch
Historian- Elsie M. Chace

Dr. Wright then gave a talk on the joys and perils of shell collecting with sometimes Jap bombs falling entirely too near for comfort, of sharks and barracuda sometimes hovering on the side lines and much too close for comfort. While he actually came across no instances of damage done by Conus written warnings were issued to the troops to beware of all cones and there were persidtent rumors of some damage and, at least, one deat resulting from their sting.

In several places barracuda were reported to be greater menace thab sharks, though Dr. Wright said a shark, on one occasion, had him " plenty scared."

He brought some beautiful shells from various newly historic locations and said he had quite a large number awaiting a general clean up and identification.

Dr. Hill reported the discovery of a beautiful submerged coral reef off Catalina that will be reported on later with the addition of new range localities of several species.

The meeting was then duly adjourned.

Effie M. Clark- Secretary.

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Dr. Joshua L. Baily Jr. sends the following very interesting note which will necessitate changing at least one of the names we used, namely Eratidae.

" I have consulted a Greek scholar about the formation of some family names, with the following results:

Erato	Eratidae
Amphiperas	Amphiperatidae
Potamides	Potamididae

I have seen the first two spelled three different ways each, and the last spelled two different ways."

Professor H.W. Miller, Academia Adventista Hispanoamericana, Apartado 1320, San Jose, Costa Rica, A.C.

" I surely don't want to miss the Minutes. Received the October number and I believe you will have to extend the range of Neosimnia avena Sowerby, as a friend and I collecting at the Boca de Barranca, a few kilometers below Puntarenas, found two specimens, one 9 mm. and the other 12½ mm., which agree perfectly with the figure in Panamic Marine Shells, M. Smith, and the breadth of the small one is 42% of its length, while that of the larger one is 44%. No other species in your table approaches that ratio of breadth and length. The color does not agree with the table but does agree with the description given on page 39 of the Minutes. With these new tables, lists, and descriptions, collecting on the west coast is going to be more interesting than ever if I can get time to do any.

I also think I have Acanthina grandis Sowerby. It is listed from the Galapagos, but my specimen looks like the figure of grandis in M. Smith's Rock Shell Catalog, and does not resemble specimens of muricata of equal size in my collection. What do you think of the possibility ? "

****

Mrs. Ruth Paulus, 918 Harliss Ave., San Jose 10, Calif. is interested in purchasing shells. Perhaps some of the members will wish to write her.
Dr. O.H. Wolner, St. Peter, Minnesota, is also interested in purchasing shells.

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West Coast Exchangers notice. The following message received by the editor should be given attention. If the press of other business did not prevent his exchanging at this time, no doubt he would even now be shipping a box. The letter is from:
Dr. L.A.W.C. Vemmans, Tolsteegsingel 13, Ubrecht, Holland. " I saw your advertisement in the Nautilus and should be very much obliged if you could send me West Coast Shells. It is not necessary to give me first your list as I don't possess anything from the coast of California.

First of all I collect land and fresh water mollusks, but I have also a great collection of marine shells. You would please me if you would send more than one specimen of the same species (e.g. at least 2 or 3).

For exchange I can send you most of the European West Coast mollusks and if you will, also most of the Dutch land and freshwater species.

All of my specimens are provided with finding place and datum. I can give you also Netherland fossils from N. Lem-Stratum."

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Earl C. Huffman, 356 Stanton St., Pasadena 3, Calif. Earl has just written that he failed to receive the November issue. If any other members fail to receive issues please advise the editor.

Mr. F.M. Bayer, Florida State Museum, Gainesville, Florida. We are indeed happy to hear from Ted who has been in the service. The following from his letter will interest his friends. " My duties as Assistant Director of the Florida State Museum resume Jan. 1st. and my address will be there." ".. " Have just returned from the Pacific Area and find a huge accumulation of Minutes. These I plan to bind when you publish the December number.."

Mr. and Mrs. John Dyas Parker, 309 North Fourteenth St., Muskogee, Okla. One of the nicest things about Christmad cards is that you get the recent addresses of old friends. We all recall with pleasure the interesting talks of Mr. Parker.

Additions and Corrections

In Minutes #39, pp. 17-18, September,1944 we discussed the species Circe margarita and subtrigona Carpenter,1857.

Dr. Fritz Haas, Fieldiana-Zoology, Chicago Natural History Museum, Vol. 31, No.2, Sept. 19,1945pp 4,5. In this paper Dr. Haas discusses the entire problem with some very interesting notes. A paratype of Circe subtrigona was discovered in the Chicago Museum. Dr. Haas diagnosed this specimen as a Semele. Dr. A. Myra Keen in our discussion had found the specimen in the National Museum to be a Petricola. However, it seems that it is certain that the species under consideration is hot a Circe and not even a venerid.

In the same paper Dr. Haas has a number of other well illustrated papers- " Late Pleistocene Non-Matine Mollusks from Honduras"- " Some Peruvian Land and Fresh-Water Mollusks"- " The Systematic Position of Plectopylis Coarctata Moellendorff"- " A Second Record of Bradybaena Similaris from the United States"- " Strobilops Aenea Pilsbry from Oahu, Hawaiian Islands.".

Another number- No. 3 of the same publication is devoted to a fine paper , 15 pp and 1 pl. " Some Remarkable Shells of a South American Fresh-Water Mussel". The species is Anodontites ensiformis Spix.

* Note* Some years ago the editor of the paper received from the River Jurua,Brazil a large box of what he identified as this species, and the shells do compare with Dr. Haas figures. However, specimens of these were sent out on exchange or gift to perhaps a hundred or more labelled Glabaris ensiformis Spix. It is suggested that my friends correct the nomenclature on the labels to the name used by Dr. Haas- Anodontites (Lamproscapha) ensiformis Spix.

Johnsonia No. 18 containing the index of Vol. I, Numbers 1 to 18 has been delivered. In addition to the index there are a number of additions to the previous issues. Number 19 will start Vol. II.

California Fish and Game Vol. 31, No. 4, Oct. 1945 has been delivered.

Dr. Alberto Carcelles, Notas Del Museo De La Plata, Tomo VIII, Zoologia no.72, " Observaciones sobre Trophon varians (d'Orbigny)". 1943

This well illustrated paper from Argentina is of some interest to us in connection with our recent consideration of the species Trophon geversianus (Pallas), the genotype. The species here discussed is closely related.

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The very best of the season's greetings to all of our friends from the Burches- John, Rose, Tom,Beatrice, and John III.

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[Rissoinidae]
Acmeidae [Truncatellidae]
Assimineidae
Capulidae
Hipponicidae

Crepidulidae
Calyptraeidae
Naticidae
Vanikoroidae

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
January 1946

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular period-ical publication. However, non-members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or $1.25 each six months.

We are now meeting the first tuesday of each month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, Calif.

Please mail all shell news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.
Phone AX 2-7965

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We will follow our annual custom of publishing a list of all members and friends, each name followed by numbers indicating their interests by the following key. Please drop a card or letter to the editor listing your interests.

1. World Wide Sea Shells
2. Pacific Coast Shells
3. Marine Shells
4. Land and Fresh Water Shells
5. Buy Shells
6. Sell Shells
7. Exchange Shells
8. Buy Books
9. Field Collecting
10. Marine Life in General
11. Fossil Shells

Please mention any additional interests not on the list.

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Mrs. Ida Worthy, Patumahoe, Auckland, New Zealand is the newly appointed overseas correspondent of the Auckland Museum Conchology Club, and we have been receiving the latest issues of the proceedings of their club. They are very interesting and our club and theirs will have a great deal in common.

Incidentally, all of our foreign correspondents are cordially invited to send their names and interests to this editor for publication in our Minutes. Those interested in exchanging would be almost certain of getting prompt results.

Genus Rissoina d'Orbigny,1840. Type (by original designation), Rissoina inca d'Orbigny.

" Rissoiform, ribbed or cancellated, whorls numerous, apex mamillated; aperture semilunar, lip thickened within, a little reflected, anteriorly effuse or faintly channeled, operculum corneous, semilunar, thick, paucispiral, with a claviform process on the inner face." (Tryon, Manual of Conchology).

The following key is from Mr. A.M. Strong's notebook.

Spiral sculpture present
• Spiral sculpture on both spire and base
•• Axial sculpture of prominent ribs
••• Ribs sublamellar, interspaces with cloth-like sculpture
•••• Length of adult shell about 5 mm. Panama. ....firmata C.B. Adams
•••• Length of adult shell about 3 mm. Gulf of Calif. .. excolpta Carp.
••• Ribs not sublamellar, sculpture not cloth like
•••• Summit of whorls shouldered
••••• Base with a distinct fasciole
•••••• Length of adult shell about 9 mm. Galapagos .... io Bartsch
•••••• Length of adult shell about 7 mm. Galapagos .... dina Bartsch
••••• Base without a fasciole
•••••• Shell elongate conic
••••••• Spiral sculpture exceedingly fine Gulf of Calif...mazatlanica Bartsch
••••••• Spiral strong Peru .... helena Bartsch
•••••• Shell broadly conic
••••••• Base with strong cords and fine lines Gulf of Calif. ..favilla Bartsch
••••••• Base with uniform cords
•••••••• Interspaces about as wide as the ribs
••••••••• Whorls strongly,roundly shouldered. Panama ...... fortis C.B. Adams
••••••••• Whorls narrowly shouldered. Gulf of Calif. .....stricta Menke
•••••••• Interspaces twice as wide as the ribs
••••••••• Basal cords 11 Panama .... gisna Bartsch
••••••••• Basal cords 15 or more . Peru................inca d'Orbigny
•••• Summit of whorls appressed, not shouldered
••••• Shell broadly conic or elongate ovate
•••••• Upper half of base smooth Gulf of Calif. ..... expansa Carpenter
•••••• Entire base sculptured. Lower Calif. .... bartholowi Bartsch
••••• Shell elongate conic
•••••• Axial ribs 20 Guadalupe Island .... guadalupensis Strong
•••••• Axial ribs more than 20
••••••• Last whorl inflated Cape San Lucas .....peninsularis Bartsch
••••••• Last whorl not inflated
•••••••• Axial ribs 32 Panama .... adamsi Bartsch
•••••••• Axial ribs 40 or more
••••••••• Axial ribs slightly protractive. Gulf of Calif. ..townsendi Bartsch
•• Axial sculpture more or less obsolete
••• Whorls shouldered at the summit
•••• Base with 10 spiral cords . Gulf of Calif...........berryi B. H. & S.
•••• Base with 20 spiral threads. Lower Calif.............kelseyi D. & B.
••• Whorls not shouldered at the summit
•••• Axial ribs entirely obsolete ,
•••• Axial ribs not entirely obsolete
••••• Spiral threads on penultimate whorl 7-8
•••••• Whorls evenly rounded Cape San Lucas ....stephensae B. H. & S.
•••••• Posterior 2/3 of whorls flattened. Cape San Lucas. melanoides B.H.& S.

(con.)

••••• Spiral threads of penultimate whorl 16
•••••• Spiral threads equal Guadelupe Island .... lowei Strong
•••••• Spiral threads unequal Gulf of Calif.......... lapazana Bartsch
• Spiral sculpture on base only
•• Axial ribs entirely obsolete Panama .... laurae deFolin
•• Axial ribs not entirely obsolete
••• Base with many spiral cords Panama .... zeltneri deFolin
••• Base without many spiral cords
•••• Base with two keels Sononata,Mex. .... contabulata Morch
•••• Base with 1 keel and 2 incised lines Gulf of Mex... hista Bartsch
Spiral sculpture absent
• Axial ribs strong
•• Interspaces between ribs sculptured
••• Interspaces with irregular crinkly markings. Lower Calif...cleo Bartsch
••• Interspaces with fine axial threads
•••• Whorls decidedly inflated. Lower Calif. .... bakeri Bartsch
•••• Whorls not inflated. Gulf of Calif...............woodwardi Carpenter
•• Interspaces between ribs smooth
••• Summit of whorls shouldered
•••• Axial ribs lamellar Gulf of California ....burragei Bartsch
•••• Axial ribs not lamellar
••••• Axial ribs on penultimate whorl 12 Gulf of Calif.... porteri B.H. & S.
••••• Axial ribs on penultimate whorl 22 Lower Calif. ....nereina Bartsch
••• Summit of whorls not shouldered
•••• Whorls constricted below the summit Central America..
effusa Morch
•••• Whorls not constricted below the summit
••••• Base with a fasciole Lower Calif. ....californica Bartsch
••••• Base without a fasciole
•••••• Axial ribs terminating at the periphery Guadalupe Island..
willetti Strong.
•••••• Axial ribs extending to the umbilical region
••••••• Axial ribs on penultimate whorl 16 Gulf of Calif. .. mexicana Bartsch
••••••• Axial ribs on penultimate whorl 20. Panama ..... clandestina Adams
• Axial ribs more or less obsolete
•• Shell elongate ovate Lower Calif. .... cerrosensis Bartsch
•• Shell elongate conic
••• Shell slender, length 2.8 mm. Lower Calif. ....dalli Bartsch
••• Shell stouter, length 3.5 mm. Lower Calif. ...... coronadoensis Bartsch

Rissoina kelseyi Dall and Bartsch,1902 San Pedro to Coronado Island
Rissoina californica Bartsch,1915. Catalina to Guadalupe Isl.
Rissoina cleo Bartsch,1915. Coronado Isl. to Guadalupe Isl.
Rissoina dalli Bartsch,1915. San Pedro to Coronado Isl.
Rissoina bakeri Bartsch,1915. Monterey to Cape San Lucas
Rissoina coronadoensis Bartsch,1915. Catalina to San Martin Isl.
Rissoina cerrosensis Bartsch,1915. Cerros Island
Rissoina townsendi Bartsch,1915. Agua Verde Bay
Rissoina bartholowi Bartsch,1915. Conception Bay
Rissoina burragei Bartsch,1915. Gulf of Calif.
Rissoina nereina Bartsch,1915. Pt. Sbreojos to Cape San Lucas
Rissoina favilla Bartsch,1915. Cape San Luvas
Rissoina woodwardi Carpenter,1856 Gulf of Calif.
Rissoina hartmanni Jordan Pleistocene- Magdalena Bay
Rissoina stephensae B. H. & S. Cape San Lucas
Rissoina berryi B. H. & S. Cape San Lucas
Rissoina porteri B. H. & S. Gulf of California

(con.)

Rissoina melanoides B. H. & S.	Cape San Lucas
Rissoina expansa Carpenter,1865	Gulf of Calif.
Rissoina peninsularis Bartsch,1915	Gulf of Calif.
Rissoina firmata C.B. Adams,1852	Gulf of Calif. to Panama
Rissoina stricta Menke,1850.	Gulf of Calif.
Rissoina excolpta Bartsch,1915	Gulf of Calif.
Rissoina mazatlanica Bartsch,1915	Gulf of Calif.
Rissoina mexicana Bartsch,1915.	Gulf of Calif.
Rissoina lapazana Bartsch,1915.	La Paz
Rissoina histia Bartsch,1915.	La Paz
Rissoina constabulata Morch,1861	Sononata
Rissoina guadalupensis Strong	Guadalupe Island
Rissoina lowei Strong	" "
Rissoina willotti Strong	" "
Rissoina effusa Morch,1860	Central America
Rissoina fortis C.B. Adams,1852	Panama
Rissoina clendestina C.B. Adams,1852	Panama
Rissoina janus C.B. Adams,1852	Panama
Rissoina zeltneri de Folin,1867	Panama
Rissoina laurae deFolin	Panama
Rissoina signae Bartsch,1915	Panama
Rissoina gisna Bartsch,1915	Panama
Rissoina adamsi Bartsch,1915	Panama
Rissoina io Bartsch,1915	Galapagos
Rissoina dina Bartsch,1915	Galapagos
Rissoina inca dOrbigny,1840	Bolivia and Peru
Rissoina helena Bartsch,1915	Peru
Rissoina allomani Bartsch,1931	Bay of Panama

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Genus Rissoina d'Orbigny,1840.
Reference- Bartsch, Paul, 1915 " The Recent and Fossil Mollusks of the Genus Rissoina from the West Coast of America", Proc. U.S.N.M. vol. 49, pp. 33-63, pls. 28-33.

Rissoina kelseyi(Dall and Bartsch)1902. Redondo Beach, Calif. (Burch) south to the Coronado Islands, Lower Calif. Type locality,San Diego.

Mr. A.M. Strong says of this species in his notebook " Rissoina kelseyi differs from nearly all the species in the genus in being variously colored, yellow to light red, unicolor, or longitudinally streaked, instead of uniformly pure white or blyish white. It belongs in the group with faint axial sculpture, but the spiral striations are strongly incised and continuous."

It was described as Rissoa kelseyi Dall and Bartsch, Nautilus, vol. 16,1 1902. Alaba oldroydi Dall, Nautilus, vol. 19, 1905, p. 15 from 10 fms. off San Pedro is in the synonymy.

Collecting data: A common dredged shell in comparatively shallow water; off Malaga Cove, L.A. Co. in 10 to 15 fms., sand bottom; off Redondo Beach in 25 fms., sandy gravel; off Ensenada, Mexico in 15 fms. sand bottom; Punta Banda, Todos Santos Bay, L.C. (Burch) off S. Coronado Island in 18 fms. (Dr. F. Baker);

Rissoina californica Bartsch,1915. Catalina Island, Calif. to Guadalupe Island, L.C. Type locality, South Coronado Island, L.C.

Mr. A.M. Strong says of this species " Rissoina californica is a very small species and like the last has strong axial ribs with smooth interspaces but the whorls are not shouldered and there is an umbilical chink surrounded by a tumid area"

(con.)

Collecting data: Off South Coronado Island, L.C. (Dr. F. Baker); North Coronado Island (F. Stephens);

Rissoina bakeri Bartsch,1902. Monterey, Calif. south to Cape San Lucas, L.C. Type locality, San Pedro, Calif.

Mr. A.M. Strong states of this species " Rissoina bakeri Bartsch is one of the smallest species in the genus. Spiral sculpture is entirely absent and the interspaces between the well developed axial ribs are marked by slender, very strong axial threads."

Collecting data: Dredged off Monterey, Calif. in 15 fms. (Burch); 10-30 fms. in Monterey Bay. Specimens from the Bay are close to but not typical R. bakeri (A.G. Smith); No. Coronado Island (F. Stephens); South Coronado Island in 3-7 fms. (Dr. F. Baker); San Martin Island (Dr. F. Baker); Hilo, Hawaii (Dr. F. Baker); San Pedro (Lowe).

The Hawaiian record by Dr. F. Baker is of interest. Dr Baker was a good student of this group. His material is all in the San Diego Museum of Natural History.

Rissoina newcombei Dall,1897. Forrester Island, Alaska and south to Monterey,Calif. (Burch). Type locality, Cumshewa Inlet, British Columbia.

Collecting data: Dredged off Monterey, Calif. in 15 fms. shale bottom (Burch); Vancouver Island (Victoria Museum) (W.J. Eyerdam);

Rissoina cleo Bartsch,1915. Catalina Island, Calif. south to Guadalupe and San Martin Islands, L.C. Type locality, off S. Coronado Id. in 3 fms.

Mr. A.M. Strong states of this species " Rissoina cleo is a very small species with strong axial ribs, the interspaces between which the irregular wavy markings which give a watered silk effect."

Collecting data: San Martin Island, L.C. and So. Coronado Islands (Dr. F. Baker)

Rissoina dalli Bartsch,1915. San Pedro, Calif. to South Coronado Island. Type locality, San Pedro, Calif.

Mr. A.M. Strong comments on this species " Rissoina dalli is sculptured with numerous, very fine, closely spaced, axial threads. It is very similar to R. coronadoensis Bartsch , but it is a smaller and more slender shell."

Collecting data: White's Point, L.A. Co., Calif. littoral (Burch); San Pedro (Lowe); Coronado Islands (F. Stephens); White's Point and Avalon, Catalina Island (A.G. Smith).

Rissoina coronadoensis Bartsch,1915. Redondo Beach, Calif. (Burch) south to San Martin Island, L.C. Type locality, off Coronado Islands in 20 fms.

Mr. A.M. Strong comments on this species " R. coronadensis is a small, elongate-conic species sculptured with numerous, slender, axial threads separated by smooth spaces about as wide as the threads."

Collecting data: Dredged off Redondo Beach, Calif. in 75 fms.; Pleistocene of Timm's Point, San Pedro (Burch); San Martin Island and So. Coronado Island in 14 fms. (Dr. F. Baker).

Rissoina sp.- Monterey Bay (A.G. Smith).

Family Anaplocamidae

Reference- Rehder, Harald A., Nautilus 56:49,50, Oct. 1942. The last lines of Dr. Rehders article will be self explanatory here " .... the family Anaplocamidae and the name Anaplocamus borealis Dall, are to be stricken from the rolls of marine mollusks."

Genus Jeffreysia Alder in Forbes and Hanley,1850. Type (by original designation) J. diaphana Alder.

The proposition Rissoella Gray,1847 vs. Jeffreysia Alder,1850 has been debated on many occasions. The following data will outline the matter.

Dr. A. Myra Keen reached the following conclusion (Per. Comm.,Nov.,1945) " Rissoella Gray,1847". Type, by original designation, Rissoa ? glabra Alder. Bartsch argues that Alder meant by Rissoa glabra the shell which later he named Jeffreysia diaphana, that this would therefore be type, and that Jeffreysia is a synonym of Rissoella. However, the Rissoa glabra of Alder is cited by him as the Rissoa glabra Brown. According to the International Rules, R. glabra Brown must therefore be the type of Rissoella. As Jeffreys points out in his British Conchology, Brown's description and illustration apparently refer to some species of Odostomia. Therefore, Rissoella is not available for use in the Rissoidae and must be replaced by Jeffreysia Alder in Forbes and Hanley,1850 (type by original designation, J. diaphana Alder.)."

John Gwyn Jeffreys " British Conchology" 1867, p.58,
Jeffreysia Alder- " Shell thin, smooth and glossy: mouth oval or roundish oval, with a complete peristome: operculum rather thin, having the nucleus on the middle of the inner side, and a short rib on the under side, which proceeds from the nucleus in the direction of the outer margin."

" Dr. Gray makes this synonymous with his undescribed genus Rissoella. The type indicated by him, in lieu of a description, is Rissoa glabra of Brown, which is evidently an Odostomia (probably O. rissoides) , having a slight plication at the base. In Gray's classified list of the Mollusca published in 1847, Rissoella is given as a synonym of Odostomia."

Reference- Bartsch, Paul,1920 " The West American Mollusks of the Families Rissoellidae and Synceratidae, and the Rissoid Genus Barleeia," Proc. U.S.N.M. vol. 58, pp. 159-176, pls. 12-13.

Mr. A.G. Smith called attention to the small hooklike part of the operculum of this genus.

Mr. A.M. Strong uses Rissoella and comments on the species placed under it as follows " The following species are placed here only provisionally. The operculum is known in only two species and the anatomy in none. They are small, thin, white, ovate shells, smooth or with very fine sculpture. Some are umbilicate, others not, and quite probably represent more than one genus."

Rissoella anguliferens (de Folin),1870. Panama Bay
Rissoella bakeri Strong,1938. Guadalupe Island, L.C.
Rissoella bifasciata (Carpenter),1856. Cape San Lucas to Mazatlan.
Rissoella californica Bartsch,1927. San Clemente Id. to San Martin Id., L.C.
Rissoella excolpa Bartsch,1920. Gulf of Calif.
Rissoella johnstoni Baker,Strong & Hanna,1930. Cape San Lucas
Rissoella tumens (Carpenter),1856. Gulf of Calif.

Jeffreysia californica (Bartsch),1927. Proc. U.S.N.M. vol. 70, p.31, pl.4, fig.2. San Clemente Island to San Martin Island, L.C. Type locality, San Clemente Island.

The original description of this species seems to have been omited from Oldroyd. It follows:

" Shell small, thin, semitranslucent, bluish white, broadly ovate. Nuclear whorls smooth, scarcely differentiated from the postnuclear turns. Postnuclear whorls very strongly inflated, strongly rounded, marked by rather strong, retractively slanting, incremental lines and very feebly developed, almost obsolete spiral threads. Periphery of the last whorl inflated, strongly rounded. Base short, inflated,strongly rounded, with a rather broad, open umbilicus which is marked at its external termination by an obsolete angle. The sculpture of the base is like that of the spire. Aperture broadly oval,

(con.).

rather expanded at the junction of the basal and outer lips. Posterior angle acute; outer lip thin; inner lip strongly curved and expanded over the parietal wall, thus rendering the peritreme complete; the outside of the inner lip at the umbilicus is marked by strong incremental lines.

The type, Cat. No. 362453, USNM, was collected by Dr. R.H. Kremper on rocks at San Clemente Island, Calif. It has 4.2 whorls and measures, length 2.4 mm., diam. 1.16 mm.

I am placing this species in the genus Rissoella with some doubt, but until I will have seen anatomic material I hesitate to give it a distinct generic designation."

Mr. A.M. Strong comments on it as follows " Shell broadly ovate, semitranslucent, with strongly inflated whorls, with strong lines of growth and very feeble spiral threads. The periphery and base is round and the rather broad umbilicus is bordered by an obsolete angle."

Family Acmeadae

Genus Acmea Hartmann,1821. Type (by subsequent designation,Iredale, 1915),Acmea truncata Hartmann - Helix subcylindrica Linnaeus.

Dr. A. Myra Keen reached the following conclusion " To my surprise I find that we must abandon Truncatella Risso in favor of Acmea Hartmann,1821, as the latter has five years priority. Acmea Hartmann,1821, Neue Alpina, Bd. 1, p. 204 (fide Sherborn); type (by sub. desig., Iredale,1915),Acmea truncata Hartmann - Helix subcylindrica Linne.). As this species is also the type of Truncatella , there seems no alternative. One can appreciate Winckworth's concern over the similarity of Acmea to Acmaea. Family, Hydrobiidae fide Winckworth."

The Iredale reference on this problem is Proc. Mal. Soc. Lon. 11:332,1915.

" Shell minute, cylindrical, truncated; whorls striated transversely; aperture oval, entire; peristome continuous. Operculum corneous, subspiral." (Tryon).

Acmea stimpsoni (Stearns),1872. Redondo Beach, Calif. south to Tres Marias Islands, Mexico. Type locality, False Bay near San Diego, Calif. (i.e Mission Bay).

In Minutes # 48, p. 11, in the discussion of Pedipes unisculatus Cooper we mentioned that this species was found in vast numbers in the same habitat- rocky rubble above high tide and under usually about two feet of the rubble.

Collecting data: Malaga Cove below the Palos Verdes County Club at or above the high tide mark under stones intersperced with dead algae. Very abundant; Newport Bay; Avalon, Catalina Island. While it is true that occasional shells are collected in the bwteen tides area or even dredged in shallow water, it will be found in my opinion that all of these will be dead shells washed down from above the tide mark. (Burch); National City, Calif. (Mrs. Sweet); San Diego (Hemphill and Orcutt); Redondo (Kate Stephens); Todos Santos Bay, L.C. (Orcutt);

Acmea californica (Pfeiffer),1857. Santa Barbara, Calif. to San Martin Id., L.C. Type locality, San Diego.

Collecting data: Newport Bay, Calif.; Punta Banda, Todos Santos Bay, L.C.; Pleistocene of Timm's Point, San Pedro. (Burch); San Diego Bay (Baker, Hemphill and Orcutt); San Martin Island (Dr. F. Baker) (San Diego Museum).

Mr. Henry Dodge, 6 Rochambeau Road, Scarsdale, N.Y. has just written a brief note about this species, and inasmuch as my duplicate material is not at this time available his request may be taken care of by some of the members with my thanks. " I would be very gateful if you could find time to

(con.)

wrap up a few Truncatella californica Pfeiffer and send them to me. You sent me a nice lot of T. stimpsoni some time ago and I have a feeling that there are some californica among them. The only real difference in the two in the Binney and the Stearns descriptions seems to be in the thinness or thickness of the outer lip and the manner in which the parietal portion of the lip adheres to the shell. Some of those in the lot of stimpsoni you sent look almost like our Atlantic bilabiata, i.e. there is a fairly well-defined double peristome."

There is a variety of this species from the southern fauna, var. guadalupensis Pilsbry.

Truncatella bairdiana C.B. Adams,1852 is listed by Mr. Strong from Panama.

Genus Cochliopa "The following species listed by Mr. Strong.

Cochliopa currugata Stearns,1890. Nicaragua
Cochliopa rowelli Tryon. Panama
Cochliopa trochulus Martens, Panama

Family Assimineidae

There seems to be a great deal of confusion among the authors about the proper taxonomy for this group. Bartsch,1920 places Assiminea Jeffreys in the synonymy of Syncera. Theile uses the family Assimineidae and genus Assiminea (Leach) Fleming,1828 placing Syncera in the synonymy with a ?

Dr. A. Myra Keen reached the following conclusion" I believe the evidence favors rejection of Syncera Gray,1821. Both the genus and species are unidentifiable from the original. I note that Winckworth (Jour. Conch., vol.19, no. 7, 1932, p. 223) adopts Assiminea Fleming,1828, with type A. grayana Fleming. A discussion of opposing views occurs in Proc. Malac. Soc. Lon., vol. 15,1922, pp. 36 and 37, by Dall and Iredale, respectively. Also Winckworth, 1934, Jour. Conch. v. 20, p. 12. "

Dr. Joshua L. Baily Jr. comments on this problem (Per. Comm. Nov.,1945) " The choice between Syncera and Assiminea is somewhat involved. Syncera is the older name, but Gray's description is unsatisfactory. Gray does not describe the shell or the radula, but only the eyes. Now it so happens that Strombus has the same kind of eyes, and Gray's description therefore applies equally well to either Assiminea or Strombus.

Whether this is a legitimate reason for discarding Syncera I cannot say. If there is anything in the context to indicate that Syncera is meant for Assiminea , then Syncera is the correct name, but if there is nothing to show whether Assiminea or Strombus is meant, then Syncera is a nomen nudum. I can express no personal opinion as I have never examined Gray's work. I can only repeat what others have told me, and it is astonishing how evenly divided opinion seems to be.

Genus Assiminea Fleming,1828. Type, A. grayana Fleming.

" Shell conic,usually strong. Nuclear whorl smooth, the rest of the shell marked by lines of growth and fine spiral striations only. Outer lip simple; inner lip continuing over the base as a thick parietal callus. Operculum subspiral,thin,horny." (Bartsch).

Assiminea translucens (Carpenter),1864. Vancouver Island to Lower Calif. Type locality, San Diego, Calif. in shell washings.

Collecting data: Mugu, Ventura Co., Calif. in debris along the edge of the lagoon, very abundant; very common in with Phytia setifer Cooper on the mud flats of Terminal Island; Malaga Cove,L.A. Co. above the high tide mark (Burch); Monterey Bay at low tide- rare; Bolinas Bay; Anaheim Bay; Newport (con.)

Bay; White's Point (A.G. Smith); National City (Emery and Orcutt); San Francisco (Hemphill).

Family Capulidae

Genus Capulus Montfort,1810. Type (by original description),Capulus hungaricus Linnaeus.

" Shell conical, apex posterior, spirally recurved; aperture rounded; muscular impression horshoe-shaped." (Tryon).

Capulus californicus Dall,1900. Redondo Beach, Calif. (Burch) south to Cape San Lucas. Type locality, on Pecten diegensis from off San Pedro in 20-25 fathoms.

Collecting data: We have taken it rather rarely off Redondo Beach and also off San Diego, always commensal on Pecten diegensis Dall (Burch); Catalina Island (Lowe);

Genus Piliscus Loven,1859. Type (by monotypy), Pilidium commodium Midd.

"Shell thin, patelliform, with thin epidermis; apex not spiral, somewhat inclined to the right and posteriorly." (Tryon & Pilsbry, Man. of Conch.)

Piliscus commodus (Middendorff),1851. Arctic Ocean to Pribilof Islands, Bering Sea, and the Okhotsk Sea (Dall). Type locality, Okhotsk Sea.

Family Hipponicidae

Genus Hipponix Defrance,1819. Type (by subsequent designation, Anton, 1839), Patella cornucopia Lamarck.

" Shell thick, obliquely conical, apex posterior; base shelly, with a horshoe-shaped impression, corresponding to that of the adductor muscle." (Woodward).

The name Amalthea Schumacher is often used, but according to Woodward, 1928, p. 373, this is a homonym of Amalthea Rafinesque.

Hipponix barbatus Sowerby,1835. Crescent City, Calif. to Guayaquil (Dall) also Hawaii (Kein). Type locality, coral reefs around Toobouai, one of the Society Islands.

None of our members have recognized this species from California. Mr. E.P. Chace comments " Calif. records probably based on jumped locality labels or wrong identification. Zetek lists it from Panama. H.N. Lowe lists it from Acapulco, Tres Marias Islands, Mazatlan etc." Mr. Strong comments on following page.

Hipponix serratus Sowerby,1835. Moss Beach, Calif. (Voorhees) (Stanford Coll. south to Panama. Type locality, Mazatlan?mexico.

Dr. A. Myra Keen makes an interesting comment on this species, (Per. Comm. 11/45) " It is possible that Hipponix antiquatus Linne is replaced on our coast by H. serratus and that we do not have the true antiquatus." H.N. Lowe lists the species from Mazatlan, La Paz and south. It is not in Zetek's list of Panama shells. Mr. E.P. Chace calls attention to the fact that Carpenter in Mazatlan Catalogue gives a description and many notes only about $\frac{1}{4}$ of which is reprinted in Oldroyd.

Mr. A.G. Smith comments " Monterey (Dall). Think the record is doubtful and needs confirming before accepting it as valid."

Discussion continued on page 11. *

Genus Hipponix Defrance,1819. Type (by subsequent designation,Anton, 1839), Patella cornucopia Lamarck.

" Shell thick, obliquely conical, apex posterior; base shelly, with a horshoe-shaped impression, corresponding to that of the adductor muscle." (Woodward).

The name Amalthea Schumacher is often used, but according to Woodring, 1928, p.373, this is a homonym of Amalthea Rafinesque.

The following keyand notes are from Mr. A.M. Strong's notebook.

Sculpture with the concentric laminae predominating
. Radial sculpture fine, close, or obsolete
.. Apex near the posterior edge
Crescent City, Calif. to Peru .... antiquatus
Oldroyd 2-3-112; Bull. Fish. Comm. 1900, p. 437
.. Apex central British Columbia to San Pedro .... cranoides
. Radial sculpture of tuberculate ribs near the apex, continuing as indented striae near the edge
Monterey to Panama .... serratus
Maz. Cat. #346
. Radial sculpture of low ribs, base spreading
Gulf of California .... planatus
Maz. Cat. #345
Sculpture with the radial ribs predominating
. Ribs close, nodulous, margin crenulated
Crescent City to Panama .... barbatus
Oldroyd 2-3-114; Max. Cat. #349
. Ribs scarce, margin acute , ribs smooth
Crescent City to Socorro Island .... tumens
Oldroyd 2-3-113
. Ribs sparce, ribs nodulous, margin laminated
Gulf of Calif. to Peru .... grayanus
Maz. Cat. # 350; Tryon 8-135
Sculpture with concentric laminae near the apex and radial ribs near the margin. Gulf of California .... delicata
Bull. Mus. Comp. Zool. 43-331

Hipponix antiquatus Linnaeus,1767	Crescent City to Peru
Hipponix tumens Carpenter,1865	Crescent City to Clarion Island
Hipponix serratus Carpenter,1856	Monterey to Panama
Hipponix barbatus Sowerby,1835	Crescent City to Panama
Hipponix grayanus Menke,1853	Mazatlan to Peru
Hipponix planatus Carpenter,1857	Mazatlan
Hipponix subrufa Lamarck,1819	Panama to Peru- Atlantic
Hipponix delicatus Dall,1908	Panama

The type locality of H. antiquatus Linnaeus is not known. Carpenter lists the species from West Africa, West Indies and Gulf of California and Panama. Adams has H. panamensis, new name for H. mitrula Sby (not Lamarck, the West Indian shell). Carpenter in Maz. Cat. gives this as a synonym of H. antiquatus but in P.Z.S.,1856, p.363, as a synonym of H. subrufa Lam. Both Dall in Peruvian Fauna and Zetek list H. subrufa as occuring from Panama to Peru in the Pacific as well as in the Atlantic.

It is possible that the species can be divided into the following geographic races.

H. antiquatus Linnaeus, West Africa
H. subrufa Lamarck, West Indies
H. panamensis C.B. Adams, Panama to Perù
H. serratus Carpenter, Gulf of Calif. to Central America

(con.)

H. cranoides Carpenter, California

The type locality of H. barbatus Sowerby is in the Society Islands. It was applied to the Panama shell by C.B. Adams. There does not seem to be any other name applied to the west coast shell.

The type locality of H. grayanus Menke seems to be St. Vincent Island (Guinea) tho Carpenter does not make a definite statement. Adams uses H. radiatus Gray,1835 (not Q. & G.,1824). H. crispa Menke is also said to be a synonym but Carpenter does not state where it is from.

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* Discussion continued from page 9

Hipponix antiquatus Linnaeus,1767. Crescent City, Calif. to Peru
Type locality unknown. This species is listed from the Florida Keys, West Indies and elsewhere and is apparently of word wide distribution. The above discussions indicate the diversity of opinion regarding it. It would be a waste of paper to attempt a list of collecting localities for this very common littoral species. In our experience it is to be taken in all rocky habitats from Monterey to Mexico. It is a littoral species but we have picked it up from as deep as 10 fathoms apparently living there. (Burch); Hilo, Hawaii; Narrabeen (San Diego Museum); Monterey Bay, common (A. Smith).

Hipponix cranoides Carpenter,1864. Vancouver Island to San Pedro.
Type locality, Vancouver Island area.

It has always been my opinion that this is simply another of those species described from a variation caused by habitat. Obviously, H. antiquatus varies greatly to conform to its location, and I have considered cranoides of very doubtful value. However, IF it should be found that our west coast species is not typical H. antiquatus, then it is quite possible that this is the name to be used for it. Mr. A.G. Smith comments " Think cranoides has little dystematic value and should be in synonymy with the typical form." Mr. E.P. Chace says " I do not consider it even a subspecies-- " flat" because it grew in a very narrow crack in the rocks and could not assume the normal form." However, there are sets in the San Diego Museum with the following labels: Crescent City (Chace); Cambria (Wilcox); Pt. Loma (K. Stephens); La Jolla (Beckwith); Point of Rocks, L.C. (Dr. F. Baker).

Hipponix tumens Carpenter,1865. Crescent City, Calif. to Clarion Island.
Type locality: Monterey-San Pedro-San Diego.

Collecting data: While it is true that we have collected this form littoral in almost the same habitat as antiquatus, the two differ in that tumens in our experience prefers crevices, and in addition we seem to have dredged tumens from considerably deeper water than antiquatus. We found tumens rather common in dredging on the shale off Monterey down to as deep as 40 fms., and have brought it up from 25 to 35 fms. off Redondo Beach and also off Catalina Island. It is unusually common in the rubble at San Onofre and also at Punta Banda. (Burch); Monterey 0 to 20 fms. (A.G. Smith); San Nicholas Island (Lowe); San Pedro (Lowe and F. Stephens); Cambria (Wilcox); San Diego (Hemphill); La Jolla (Bristol and Beckwith) (San Diego Museum).

Family Crepidulidae

Genus Crepidula Lamarck,1801. Type (by monotypy), Patella fornicata Linnaeus.

" Shell oval, limpet-like; with a posterior, oblique, marginal apex; interior polished, with shelly partition covering its posterior half" (Woodward).

The following list of species is from Mr. A.M. Strong's notebook.

Crepidula onyx Sowerby,1824	Monterey to Chile
Crepidula excavata Broderip,1834	Monterey to Peru
Crepidula adunca Sowerby,1825	Vancouver to Cape San Lucas
Crepidula orbiculata Dall,1919	Bering Sea to San Diego
Crepidula aculeata (Gmelin),1791	Port Harford to Chile
Crepidula exuviata Nuttall	California and south
Crepidula incurva (Broderip),1834	San Pedro tp Peru
Crepidula dilatata Lamarck,1824	Gulf of Calif. to Chile
Crepidula arenata Broderip,1834	Scammons Lagoon to Peru
Crepidula crepidula Linnaeus,1764	Gulf of Calif. to Peru
Crepidula squama Broderip,1834	Panama to Patagonia
Crepidula lessonii Broderip,1834	Panama
Crepidula rostrata C.B. Adams,1852	Panama
C. (Crepipatella) lingulata Gould,1846	Bering Sea to Panama
C. (Crepipatella) strigata Broderip	Peru to Magellan Strait
C. (Inacus) nummarius Gould,1846	Bering Sea to Mazatlan
C. (Ianacus) fimbriatus Reeve,1859	Vancouver to Panama
C. (Ianacus) perforans Val.,1846	Puget Sound to Panama

Genus Zeidora

Zeidora flabellum Dall,1902. Clarion Island

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Subgenus Crepidula s.s.

Crepidula grandis Middendorff,1849. Cape Franklin, Arctic Ocean, south and east to Sitka,Alaska. Also Kamchatka. (Dall).
Type locality, St. Paul Island, Bering Sea.

Collecting data: Izhut Bay, Afignak Island, Kodiak group, Alaska; Atka Island, Aleutian Islands,1932 (W.J. Eyerdam); fossil at Capitola, Santa Cruz Co. and also Los Angeles near 5th and Olive (Grant and Gale) (E.P. Chace).

Crepidula onyx Sowerby,1824. Monterey, Calif. to Chile.
Type locality not given.

Collecting datd: This very common species seems to thrive in almost every habitat. It is found far up in the estuaries as well as in the open sea. It is often taken on other species as well as stacking up on other specimens of the same species. We have taken it from Pecten, Megathura,Kellettia Conus and many other littoral gastropods. The bathymetric range is of some interest since we have found it rather common off Redondo Beach down to nearly 50 fms.

There is a race of this species in Todos Santos Bay, L.C. that is much smaller and of a uniformly different shape. The deck is obviously an onyx deck though, and at best it could be but a subspecies. However, they are sufficiently different to be separable,and sooner or later I expect someone to describe them. They may be found either in the Estero or out on Punta Banda.

(con.)

The subspecies rugosa Nuttall, MS,Carpenter,1856 has been generally ignored or placed in the synonymy of the typical. It is supposed to be those with the heavy rough periostracum, but this species assumes almost every variation immaginable. It is of no consequence in my opinion.(Burch).

Mr. E. P. Chace comments " Punta Banda form of C. onyx has a leaning towards C. incurva, a southern form. H.N. Lowe got incurva at Guaymas and south."

Mr. A.G. Smith writes " The Monterey record needs confirming and an extension of range this far north not accepted as valid until it is."
* Note* It is true that none of our members have reported C. onyx from Monterey. I have never recognized it from there. However, this is a Dall record and the material on which it is based is presumably in the U.S. Nat. Mus. We are therefore almost bound to continue these Dall records until they are definitely proven to be erroneous.*

Crepidula excavata Broderip,1834. Monterey, Calif. to Peru.
Type locality, Real Llejos (Nicaragua).

Collecting data: Common on Polinices between Seal Beach and Huntington Beach; also on Polinices in the Estero below Ensenada, common; a small form of excavata is very common commensal on the small Mitrella carinata in the Estero de Punta Banda and occasionally also found on Conus although the usual form on Conus is onyx. Dredged off Malaga Cove and also off Catalina Island in comparatively shallow water. Abundant in the Pleistocene of the Baldwin Hills, Del Rey deposit (Burch); Pt. Reyes on Haliotis rufescens, 1 fine specimen(A.G. Smith); a long narrow form grows on the tall spined shells, Turritella, Drillia etc. - used to be fairly common at Sea Beach- also on Olivella biplicata at Seal Beach. (E.P. Chace); San Felipe,L.C. (F. Stephens); San Diego (Kelsey); Long Beach (Lowe); Montijo Bay, Panama (Lowe) (San Diego Museum);

Crepidula excavata naticarum Williamson,1905. In my opinion there is no more useless name on the list. If anyone can show me how to separate C. excavata in my collection taken from a dozen or more different things and those from off the Polinices, I will be very much interested to hear.(Burch).
" Agree that this has little or no systematic value. If you call norrisiarum a species then would'nt naticarum be a synonym of this rather than excavata? (A.G. Smith).

Crepidula norrisiarum Williamson,1905. Type locality, San Pedro on Norrisia. I held forth for years that this is a good species. However, I am now disposed to think that it should be in the synonymy of excavata. After seeing specimens in Mr. A.G. Smith's collection and comparing them with typical excavata it is my present opinion that they cannot be separated. Obviously the specimens living on Norrisia would assume some variation. We have taken this everywhere we have found Norrisia , and for that matter there is apparently no difference between those from Norrisia and those from Haliotis and other forms. We have taken it from H. cracherodii at Cayucos, Calif. and south to Punta Banda and Arbolitos. It is unusually common around Malaga Cove and in Todos Santos Bay (Burch).

Dr. Joshua L. Baily Jr. comments " Crepidula norrisiarum looks like a good species to me, but Dr. Wesley Coe, of the Scripps Institution at La Jolla, does not. As he has raised it experimentally I would be inclined to accept his judgement."

However, for the benefit of those who may still maintain it as a species the following collecting localities have been submitted: Common on Norrisia at Refugio,Santa Barbara Co. (E.P. Chace); Coronado on Norrisia (Bristol); San Diego (Chaney); Ocean Beach (Kate Stephens); La Jolla (Edna N. Wilson); San Diego (Gripp); San Pedro (Dr. F. Baker); Long Beach (Lowe).

Crepidula arenata (Broderip),1834. Proc. Zool. Soc. London, Part II, p.40.
La Jolla, Calif. (A.G. Smith) south to Peru.

The original description of this species which Mr. Smith now adds to the California fauna follows:

" C. testa subovata, albida rubro-fusco creberrime punctata; intus subrubra vel albida subrubro maculata, septo albo: long. 1 1/8, lat. 7/8, alt. 4/12 poll. Hab. ad Sanctam Elenam." (i.e northern Ecuador.)

" This approaches Crepidula porcellana. The septum is somewhat distant from the margin, and the apex, which is also somewhat distant from it, is obtuse and obliquely turned towards the right side. From sandy mud, on shells , at a depth ranging from six to eight fathoms."

Crepidula incurva Broderip,1834. San Pedro, Calif. to Peru.
Type locality: Santa Elena and Xipixapi (Ecuador), 6-10 fms.

" Testa fusco nigricante, tortuosa, corrugata, intus nigricante,septo albo, apice adunco. Long 6/8, lat. ½, alt. 3/8 poll."

Collecting data: This is another species of the southern fauna with a very questionable California record. I have certainly seen nothing from California that resemble those for example from Panama sent by Zetek.(Burch). Many localities from Lower Calif. to Panama taken by Frank Stephens and Lowe (San Diego Museum- Miss Bristol).

The original description of this species was omited from Oldroyd so we gave it above.

See discussion on page 18- top of page

Crepidula orbiculata Dall,1919. Bering Sea to San Diego,Calif.
Type locality, Royal Roads, Victoria, Vancouver Island, B.C.
Collecting data: 52-55 fms. off Pt. Pinos (A.G. Smith).

Crepidula fornicata Linnaeus,1758 Coast of Washington introduced from the Atlantic.

Collecting data: Willapa Bay, Wash. almost certainly introduced with seed oysters (E.P. Chace); on native oysters (Ostrea lurida) near Olympia, Wash. Introduced from Atlantic. (W.J. Eyerdam).

Crepidula convexa glauca Say,1822. Alameda,Calif. introduced with seed oysters from the Atlantic. Johnson gives the Atlantic range, Nova Scotia to Florida and Texas.

Mr. A.G. Smith calls attention to Packards records of this species. South San Francisco Bay near the oyster beds (Packard). Packard,1918, Molluscan Fauna of S.F. Bay, p. 323, places glauca in the synonymy of convexa."

Crepidula adunca Sowerby,1825. Vancouver Island to Cape San Lucas.
Type locality not given.

Collecting data: Our experience has been to find this a very common species in the northern part of the range becoming increasingly rare in southern California. We have taken it at Crescent City; Monterey; San Simeon; Cambria;Cayucos- common on Tegula; dredged off Monterey in 10 to 20 fms.; Bird Rock and Mission Bay, San Diego Co. (Burch); dredged off S. Coronado Island in 14 fms. (Dr. F. Baker); Puget Sound (W.J. Eyerdam); Crescent City to So. Coronado Islands. (San Diego Museum).

Crepidula aculeata (Gmelin),1792. Port Harford to Chile.
Type locality: Ad Insulas Americae Mediae "

This species must be of world wide distribution or else not well enough known. Johnson reports it from the Atlantic, North Carolina to Texas and the

(con.)

West Indies. I note that in my collection I have sets from Queensland as well as New South Wales, Australia; Brazil; Hawaiian Islands; South Africa etc. They all look very much alike.

Collecting data: Our experience has been to find this species comparatively rare. However, we have taken it from a great many localities: Cayucos, San Dimeon, Monterey,Malaga Cove, Point Fermin, Bird Rock, La Jolla, San Onofre, and other points. One possible note of interest is that an excellent place to look for them is on kelp holdfasts. (Burch). It was suggested by Mr. A.G. Smith that perhaps some of the records of this species such as mine from Monterey may be of C. orbiculata Dall,1919. This is quite possible since very few of us are familiar with orbiculata.

Mr. W.J. Eyerdam writes " I have this species through exchange from Florida and several other Atlantic localities. I have collected it at Cayucos, Calif., Mazatlan,Mexico; Gulf of Fonseca,Honduras; La Union,Salvador;Corinto, Nicaragua; Supe,Peru; and Arica,Chile. They are all about the same."

Genus Crepipatella Lesson,1830. Type (by subsequent designation, Gray,1847): Calyptraea adolphei Lesson= Crepidula dilatata Lamarck. In dilatata, as in lingulata, the deck is separated from the shell on one side. (Dr. A.M. Keen). * See discussion bottom of page 17.

Crepipatella lingulata Gould,1830. Bering Sea to Panama. (C. dorsata Brod. of Carpenter). Type locality, Puget Sound, Washington.

Collecting data: This common species may be found on almost all rocky rubble reefs and such places as the San Pedro breakwater; also common commensal on other mollusks. Astraea undosa Wood is frequently covered with them. In dredging it is brought up from all depths to as deep or deeper than 50 fathoms. We have it in great numbers from off Monterey in 10 to 40 fms.; off Redondo Beach and Catalina Island in 25 and 35 fms.; very common on the dredged Kellettia kellettii Forbes from off Redondo Beach . It is a common species in some of the San Pedro Pleistocene deposits. (Burch).; Crescent City to Ensenada and the Coronado Islands (San Diego Museum); Port Orchard and Agate Pass, Puget Sound, Wash.; Drier Bay, Knight Island, Alaska,1923 on stones and dead shells (W.J. Eyerdam);

Crepidula con.

Subgenus Ianacus Morch,1852 Cat. Yoldi, p. 146. Type (by subsequent designation, Harris,1897): Crepidula plana Say. No description in original. Evidently intended for the thin, flat, white Crepidulas like our nummaria.

Crepidula crepidula (Linnaeus),1767. Linn. Syst. Nat. p. 1257, no. 752 (Ed. 12). Patella crepidula Linnaeus,1767.

And in connection with the above Crepidula unguiformis Lamarck,1818 Lam. An. sand Vert. VI, Pt. 2, p.25, No.4.

The above data is mentioned in order to make what may seem to many a facetious suggestion, and that is that insofar as the small white species are concerned we might do well to go back to Linnaeus and throw everything else in the synonymy down to date. Say,when he described C. plana,as well as most of the other authors have expressed doubt that their species is distinct. If anyone seriously thinks that he can take a mixed lot of these shells taken from the apertures of dead gastropods from literally all over the earth and separate them, I would be greatly interested in the method. There is some discussion by authors of the notch or lack of it, but I see the same deckand the same notch in all of them. Please understand that it is simply my personal opinion that this is but one world wide species, and that I am a minority opinion of one. Therefore, the approved nomenclature of the majority will follow. (Burch).

Crepidula nummaria Gould,1846. (C. navicelloides Nuttall).
Plover Bay, Bering Strait to Panama. Type locality: Classet (Straits of Juan de Fuca).

The problem involved here is whether or not this is distinct from the small pure white species commonly found in the apertures of dead gastropods etc. The original description of nummaria specifically mentions a " thick yellowish eipdermis" which seems to be entirely absent from the other species which must correspond to the Atlantic C. plana Say. C. nivea C.B. Adams might cover the pure white species adequately if it is distinct. The majority of recent writers have been disposed to place nivea in the synonymy of nummaria . Mr. Allyn G. Smith first suggested that perhaps the heavy species commonly found under large stones in such localities as San Simeon, Cayucos etc. and also on such things as the San Pedro breakwater are nummaria, and that nivea is a distinct and good species.

Collecting data: Mr. A.G. Smith writes " We have not found this in Monterey Bay although it is found both northand south of this locality. Have never found this in pholad holes, have you ? The pholad hole species is perforans (= nivea C.B. Adams) in my opinion."

Crepidula nivea C.B. Adams,1852. Cat. of Shells collected at Panama, no. 351, p. 234. The original description follows:

" Shell ovate-eliptic: rather thick: within snow white: without dingy white,sometimes with a faint tinge of brown: very irregularly concentrically more or less wrinkled, with very distinct striae of growth: apex turned more or less to the right, moderately prominent, marginal: septum longitudinally subangular, with a deep sinus at the left and a shallow one at the right: margin thick, exhibiting striae of growth. It closely resembles C. unguiformis, but constrntly differs in characters and station. Length 1.4 inches; breadth 1 inch; height .4 inch.
Station- Under stones, near low water mark
Habitat- Panama
45 specimens collected on reef."

Mr. A.G. Smith advises on this species " Gordon and I put the following in synonymy: fimbriata Reeve, perforans Valenciennes (= exuviata Nuttall) on the basis that they are more situs forms. I have specimens in my collection from San Pedro that seem extremely close to the eastern C. plana Say."

Mr. E.P. Chace comments " I have smooth specimens of C. nivea from Pecten shells , Mugu Bay, that are anything but white- range from light brown to very dark brown all except the decks."

Miss Viola Bristol of the San Diego Museum reports " Dr. J.L. Baily says this is a synonym of C. squama Broderip,1834 and ours are so labelled." Specimens from Magdalena Bay to Panama.

However, the majority opinion at this time seems to be to use this name for our pure white species without epidermis commonly taken in the apertures of dead gastropods. Records usually read as follows: " from dead Thais shells at Monterey"; " from dead Tegula at San Simeon"; " from dead Bursa and Kelletia dredged in 25 fms. off Redondo Beach". This is a very common Pleistocene fossil in the Timm's Point and other San Pedro deposits, also Baldwin Hills Del Rey etc. (Burch); Port Armstrong, Baranof Island, ~~Crepidula~~ 1917; Port Orchard, Kitsap Co., Wash.; Ishut Bay, Afognak Island, Alaska,1922 (W.J. Eyerdam).

Crepidula nivea perforans Valenciennes,1846. (C. exuviata Nuttal Reeve,1859)
Puget Sound to Panama. Type locality not given. Habitat in pholad holes. This is another subspecies described from a form caused by habitat. This entire group is disposed to vary to suit their location and naturally this suits itself to a pholad hole. I consider it of no consequence whether it is novea, nummaria or what. Have collected it in many localities: dredged in

(con.)

pieces of shale off Monterey in 10 fms.; Cayucos, Calif. in pholad holes in stones just off the townsite; White's Point, Los Angeles Co. in pholad holes in shale. (Burch); Kino Bay (Lowe); Montijo Bay (Lowe); La Jolla(Brier& Bristol

Crepidula fimbriata Reeve,1859. Vancouver, B.C. to Panama. Type locality, Vancouver Strait. This is another species to be placed in the synonymy by the consensus of opinion. Dr. A. Myra Keen comments " Seems unnecessary". Smithand Gordon place it in the synonymy. The San Diego Museum have sets labelled using it as a subspecies of nummaria. Mr. E.P. Chace comments " I have specimens from Panama that look exactly like the figure in Reeve Conch. Icon. An occasional specimen of - C. nivea or nummaria has a leaning toward it.

Crepidula glottidiarum Dall,1905. Santa Monica, Calif. to San Pedro on Glottidia albida Hinds. Type locality, San Pedro.

This species is usually considered a subspecies of nummaria. It may be. However, the statement that it is found only on Glottidia is incorrect. We have dredged it on stones off Redondo Beach in 25 fms. gravel, and it still retains its general shape and can be easily separated. Of course, it may be that after attaining a growth to the form on Glottidia these specimens were accidentally moved to the stones. One thing seems clear and that is that IF the two species discussed above, Nivea and nummaria are really two species, then glottidiarum should be a subspecies of nummaria rather than nivea because it does have a very definite yellow epidermis. Inasmuch as Glottidia albida is itself a very common dredged form all around Santa Monica Bay, this Crepidula is also more or less common. (Burch). Mr. A.G. Smith suggests that it would be of value to study the anatomy of this species, radula etc. and compare with nivea and or nummaria. Mr. E.P. Chace comments " My opinion is that it is a situs form. As you know almost any Crepidula will grow in almost any shape- especially true of C. nummaria and nivea." Reported from Treminal Island, San Pedro (Lowe) (Set in San Diego Museum).

* Continued discussion of Crepipatella from page 15.*

The following statement has been received from Dr. W.P. Woodring, United States Department of the Interior, Geological Survey, Washington,D.C.

" Crepipatella Lesson,1830, Voyage de la Coquille, Zoologie, vol.2, pt.1, p. 389. Type (designated by Gray,1847)- Calyptraea adolphei Lesson (- Crepidula dilatata Lamarck, fide Dall), Recent, Peru. The type species lacks pronounced sculpture, but the deck has a deep abapical indentation and a minor indentation and swelling near the middle. On account of the peculiar deck characters, I prefer giving generic rank to Crepipatella-. Verticumbo, which has the same deck characters, might be given subgeneric rank under Crepipatella, on account of the sculptured apex. I am, however, not recognizing it. Crepipatella charabdis is probably closely related to the unfigured Crepipatella orbiculata, which has no sculpture."

We are disposed to follow Dr. Woodring's suggestion and use Verticumbo as a subgenus of Crepipatella.

Subgenus Verticumbo Berry,1940. Bulletins of American Paleontology, vol. 25, no. 94A, p.7.

" Shell subcrepiduloid, but with an expansive, clearly spiral, excentric dextral shell, and a strongly excentric concave deck within." Type- V. charabdis Berry,1940.

(con.)

It seems from Dr. Woodrings conclusions that we must consider the species discussed on page 14, *Crepidula orbiculata* Dall,1919, a species of the genus *Crepipatella.*

Crepipatella (Verticumbo) charybdis (Berry),1940. Bulletins of American Paleontology, vol. 25, no. 94A, Paleontological Research Institution, Sept. 28,1940. pp 8-9, Pl. 1, figs. 6-10.

" Shell subcrepiduloid or haliotoid, rather thin, chalky, fragile, almost circular, moderately elevated; nucleus of about 1½ whorls, strongly spirally mammillate, excentric, posterior, the shell thence expanding rapidly to matutity ; highest at nucleus or just in front of it; exterior surface either unsculptured except for numerous growth lines of varying strength, or exhibiting a varying number 9 up to 15 or 16) of coarse, irregularly sinuous, radial (i.e spiral) ridges, running in general perpendicular to the tangent of the growth lines. Interior white to light-buff, polished, the short wide deck convex, strongly excentric, and covering perhaps a quarter of the main cavity." Measurements of holotype in mm.- Long. 8.7; lat. 9.2; alt. 3.6. Type locality- Lower Pleistocene, bluff in alley south of Second St. and east of Pacific St., San Pedro, Calif."

In the discussion following the description Dr. Berry states " *Crucibulum, Calyptraea* and *Crepidula* all exhibit certain points of similarity, but the persistence to maturity of an indisputable spiral shell, as well as the corresponding structure of the deckand interior cavity, separates it from each of these. To which of the genera mentioned it is most closely allied is thus not clearly apparent,and perhaps will not be unless and until its presence is revealed in the Recent fauna and an investigation can be made of the anatomy. That it should so come to light would surprise me not at all, although to date, I have not seen the species evenas a fossil in any later formations than those indicated. Considerable variation is evident in the shells in hand, all my larger shells from Timm's Point being smooth, but I feel that the sculptural differences noted are more likely to prove of situs than of race or even of the stage of maturity, although the latter consideration is of course not out of the question. The holotype is doubtless immature, but was selected because of the clear showing of some of the more trenchant characters."

Collecting data: Dredged Recent in 50 fathoms off Redondo Beach, Calif. on both sides of the submarine canyon; also very common in the Pleistocene of Timm's Point, San Pedro, Calif. This is a very distinctive species although at first glance reminding one of *Crepidula aculeata* (Gmelin). (Burch).

Additions and Corrections

Family Calyptraeidae

Genus Crucibulum Schumacher,1817. Type (? Monotypy): C. planum Schumacher = Patella auricula Gmelin. Dr. A. Myra Keen comments " I am in some doubt as to whether this is trully monotypy; Schumacher named two species as types of two sections, C. planum and C. rugoso-costatum, but according to Dillwyn, both names apply to the same biologic entity, an Antillean species."

" Differs from Calyptraea in the internal cup-shaped lamina, which is entire and attached along a line on one side to the inndr wall of the shell." (Tryon).

The following list of species and notes are from Mr. A.M. Strong's notebook.

Genus Crucibulum Schumacher,1817.		
Crucibulum spinosum (Sowerby),1824	Trinidad to Chile	
Crucibulum imbricatum (Sowerby),1824	La Jolla to Chile	
Crucibulum quirquinum Lesson,1830	Gulf of Calif. to Magellan Strait	
Crucibulum pectinatum (Sowerby)	Gulf of Calif. to Panama	
Crucibulum umbrellum Deshayes,1830	Gulf of Calif. to Panama	
Crucibulum trigonale Adams and Reeve,1850	Central America	
Crucibulum radiatum Broderip,1834	Panama	
Crucibulum serratum (Broderip), 1835	Peru	
Genus Trochita Schumacher,1817.		
Trochita radians Lamarck,1822	Gulf of Calif. to Panama	
Trochita trochiformis Gmelin,1791	Panama to Peru	
Trochita intermedia d'Orbigny,1841	Peru	
Genus Cheilea		
Cheilea cepacea (Broderip),1834	Gulf of Calif. to Panama	(equestris L.)
Cheilea corrugata (Broderip)	Gulf of Calif. to Peru	
Genus Calyptraea Lamarck,1799		
Calyptraea contorta Carpenter,1856	Catalina to Gulf of Calif.	
Calyptraea mamillaris Broderip,1835	Magdalena Bay to Peru	
Calyptraea conica Broderip,1834	Gulf of Calif. to Panama	
Calyptraea subreflexa Carpenter,1855	Gulf of Calif.	
Calyptraea lichen Broderip,1834	Ecuador	
Calyptraea unguis Broderip	South America	

Crucibulum imbricatum Sowerby,1824. Tryon uses C. scutellatum Wood. This is from Wood's Index Test. Suppl. This should be credited in Hanley and dated 1828. Under this are placed C. dentatus Menke,1847; C. gemmacaeum Val.; extinctorium Sby.;C. planatum Morch; C. rugosum Lesson;,1839 (not Desh.); Dall places C. auratum Reeve here but Tryon gives it from West Indies.

Crucibulum spinosum Sowerby,1824. Tryon calls this a variety and uses the name C. tuberiferum Lesson which should take the date 1830. Under this are placed C. pezizum Hanley(Wood),1828; C. hispidium Brod.,1834 and C. cinereum (Gray),1842.

Crucibulum quirquineum Lesson,1830. Tryon calls this a variety but Dall lists it as a distinct species. Carpenter says of this " The quirquina of Lesson and d'Orbigny belongs to a southern type which may be distinct; though it has characters enough in common to make it not impossible that it is a coarse variety. It is characterized by a more solid texture, light reddish brown color, entire absence of spines, and less angulated cup"

(con.)

Under this are placed C. tenuis Brod.(tenue); C. lignarium Brod.,1835; C. rugosum Desh.(not Lesson); C. ferrugineum Reeve,1858; and C. spectrum Reeve,1859. C. maculosum Brod.,1834 is placed here by Dall but under C. spinosum by Carpenter and Tryon. The same applies to C. striatum Brod.(not Say).

Crucibulum radiatum Broderip,1834. Tryon gives this species as doubtful and Dall makes no mention of it. Carpenter says of it, " The C. radiata, in most respects agreeing with C. spinosa, differs in the remarkable flattening of the cup, and in its greater separation from the margin."

Crucibulum umbrellum Deshayes. Tryon places this under C. imbricatum Sby. Carpenter says of it, " This latter species (comparing with imbricatum) is generally longer, more spreading, of a lighter color, and with the cup only adhering close to the apex. The ribs are also less developed and never pitted." Carpenter says this equals C. rude (rudis) Brod.,1834.

Crucibulum trigonalis Adams and Reeve,1850. Carpenter says of it. " China Seas. This scarcely differs in any essential particular from Crucibulum lignarium Brod. and its varieties from South America. The trigonal form may be an accident of growth."

Crucibulum pectinatum Carpenter,1856. Carpenter places C. corrugatum Cpr. (not Brod.) and C. jewettii Cpr. here. Dall and Tryon place these under C. imbricatum Sby. See Reeve, pl.3, fig.7 for description and figure.

Crucibulum serratum Broderip. Dall and Tryon place this under C. imbricatum Sowerby. Carpenter says of it " Like the young of C. pectinatum; nearly transparent; white with purple ray." See Reeve, pl.7, fig.21 for description and figure.

Trochita radians Lamarck,1822. Of Trochita ventricosa Carpenter he states " It differs from the S. American T. radians and also from the Gulf species T. spirata, in the great convexity of the whorls, which are so produced at the shoulder that the sides form nearly a right angle." It seems probable that C. radians Lam. , C. spirata Forbes and C. ventricosa Carpenter are all one species. To these should be added Patella poculum (Wood)Hanley.

Trochita trochiformis Gmelin,1791. As described by Dall this is a distinct and smaller South American species. Dall places under it C. araucana Less. C. dilata Sby. and C. sordida Brod. The last is said by Carpenter to be a Galerus.

Trochita intermedia d'Orbigny,1841. Listed by Dall from Peru. No further references or a description found.

Cheilea equestris Linnaeus,1758. Tryon and Dall both use the name of the West Indian species and place the West Coast C. cepacea Broderip,1834 under it. Carpenter says of C. cepacea " This shell is easily distinguished from the West Indian species, C. equestris, etc. both by the vertex and the markings " A number of other names are listed but if described from the west coast the fact is not so stated.

Cheilea corrugata Broderip.Listed by Tryon and Dall as distinct. Seems to be distinguished by a coarser sculpture.
Calyptraea tortilis Reeve and Calyptraea alveolata Reeve from the Galapagos are listed as questionable species of Cheilea.

Calyptraea fastigiata Gould,1846. Seems to be a distinct Puget Sound species as listed by Dall.

Calyptraea contorta Carpenter,1856. Seems to be a distinct Southern Calif. species as listed by Dall.

Calyptraea mamillaris Broderip,1834. This is C. regularis C.B. Adams and C. lamarckii Mke. (not Desh) according to Carpenter. Carpenter distinguishes the species mainly by the nuclear whorls which are " generally rather separated fromthe shell, and of an elegant discoidal shape like Planorbis, displaying the whorlsand the sunken apex." Tryon places everything from the coast under this species.

Calyptraea conica Broderip,1834. This is C. aspera C.B. Adams and of Reeve according to Carpenter. Carpenter says of the nucleus, " the vertex in this species is generally eroded, butm, when perfect, about .02 across, not prominent, with the outer whorl enveloping the rest, apex not visable."

Calyptraea subrefloxa Carpenter,1855. See Tryon and Reeve for description.

Calyptraea lichen Broderip,1834. Dall recognized this as distinct in Peruvian Fauna. Carpenter says in speaking of C. mamillaris in Mus. Cumings " Some of these as well as G. lichen, closely resemble the young of C. conica A microscopic examination of the nuclear vertices would probably decide the question."

Calyptraea unguis Broderip. Carpenter says, " The C. mamillaris of d'Orb. is the C. unguis of Brod. and appears a distinct species, of which C. sordida Brod. is probably a variety; the laminae being so much reflexed as to pass into Crucibulum, the young of which however it does not resemble at all." There seems to be no further records of this species which is left of uncertain standing.

Genus Crucibulum Schumacher,1817.

Crucibulum spinosum (Sowerby),1824. Trinidad, California to Tome,Chile and the Galapagos Islands. Type locality not given.

Collecting data: A very common species in great abundance in certain localities. Newport Bay on dead valves of Pecten and Ostrea; very common all around Mission Bay,San Diego Co. especially on dead valves of Ostrea; dredged off Malaga Cove in 10 to 15 fathoms on gravel and shell, and these specimens are slightly different from the typical bay form; common on dead shell in the Estero de Punta Banda, L.C. An interesting note on these was the large percentage of albinos among them, many of them almost pure white but otherwise perfect living specimens. (Burch); San Felipe, Gulf of Calif. (Earl Huffman); Guaymas,Sonora, Mexico (Mrs. A. Stahman); Gulfo de Nicoya (M. Valerio); Panama, Taboga Island (Baker- Zetek); Scammons Lagoon (Dr. F. Baker); Guaymas,Mex. (W.J. Bower); Mr. A.G. Smith writes " Willard M. Wood reported taking 9 specimens at Monterey in 1893, but none have been reported from there since. The record is doubtful until confirmed." The same would apply to the Trinidad record.

Crucibulum imbricatum (Sowerby),1824. This is a species of the southern fauna as discussed above and not of California. Dr. Joshua L. Baily Jr. explains the origin of the California record of La Jolla in a recent letter " Crucibulum imbricatum from La Jolla. If you base this record on my note in the Nautilus you had best discard it. I was only 14 years old when I found that specimen and didn't know what C. imbricatum really was. Also, I didn't get it at La Jolla, but at Pacific Beach. This opportunity to correct an error is welcome, and I hope you will publish my retraction of this misstatement."

Collecting data: W.J. Eyerdam reports taking this species from Mazatlan, Gulf of Fonseca,Honduras,Corinto,Nicaragua and Talara,Peru. and C. spinosum from Mazatlan,Gulf of Fonseca,Honduras,La Union,Salvador,Corinto,Costa Rica.

Genus Calyptraea Lamarck,1799. Type (by monotypy), Patella chilensis L. " Shell oval, limpet-like; with a posterior, oblique, marginal apex; interior polished, with a shelly partition covering its posterior half." (Woodward).

Calyptraea fastigiata Gould,1856. Port Etches, Alaska to Redondo Beach, Calif. (Burch). Type locality, Puget Sound.

Grant and Gale place this in the synorymy of C. mamillaris Broderip, 1834. The general idea seems to be that fastigiata is strictly a northern species ranging no farther south than Puget Sound whereas mamillaris is a southern species ranging not as far northas San Diego. All in between must therefore be C. contorta. There is a great deal of confusion about the species under this genus.

Mr. George Willett in Trans. San Diego Soc. Nat. Hist.,1937, vol.8, no. 30, states " .... C. contorta may be a stunted, southern form of fastigiata, but both differ from mamillaris of southern waters in their thinner shell."

However, we have been disposed to think t hat we have been getting two distinct species of Calyptraea off Redondo Beach- the small C. contorta Cpr . in great abundance from the comparatively shallow gravel beds ranging from 15 to 30 fathoms and what we considered the northern C. fastigiata in from 50 to 75 fathoms.

We also dredged another lot from the shale off Monterey which we understand may be a new species. They are being considered by Mr. Allyn Smith and Mackenzie Gordon.

Collecting data: Dredged off Redondo Beach in 50 and 75 fathoms gravel bottom (Burch); Point No Point, San Juan Islands, Washington in rock and shell bottom (Miss R.E. Coats); dredged in Puget Sound (T. Kincaid); Puget Sound (Randolph); Orcas Id., P.S. in 10 to 30 fms. (Dr. F. Baker); San Juan Islands (Lowe)(San Diego Museum); Puget Sound, San Juan Islands; Izhut Bay, Afognak Island and Drier Bay, Knight Island, Alaska- droged- (W.J. Eyerdam).

Mr. A.G. Smith writes " Have seen no undoubted specimens from Monterey, although reported from there by Cooper. "

Calyptraea contorta Carpenter,1865. Monterey, Calif. to Gulf of Calif. Type locality: This has been generally published as Monterey but Dr. A. Myra Keen advises that it is Catalina Island, Calif. from the holotype label in the U.S.N.M.

Collecting data: As stated above under discussion of fastigiata, we have found this small species extremely abundant usually attached to pieces of shell or small gravel off Malaga Cove in 15 fms.; Redondo Beach in 25 fms/; Point Vicente in 20 fms.; Avalon,Catalina Island in 25 fms/; off Santa Cruz Island in 50 fms. (Burch). Of course, it is quite possible that we have a single species with the specimens from deeper water and naturally colder water attaining much greater size. The principle difference seems to be that the deeper specimens are simply much larger and much lower spired. (Burch). Monterey Bay in 15 to 40 fms. This is a good species of small size (A. Smith); S. Coronado Island (Dr. F. Baker); San Felipe, Gulf of Calif. (Frank Stephens); San Diego (Gripp); San Pedro (Lowe) (San Diego Museum).

Family Naticidae

The following keys and lists are from Mr. A.M. Strong's notebook.

Shell porcelanous, thick or fairly so
• Operculum shelly .... Natica
• Operculum horny ....Polinices
Shell thin, more or less pellucid
• Shell oval or oblong ....Eunaticina
• Shell depressed, aperture ear-shaped .... Sinum
Shell minute, spire elevated .... Elachisina

Genus Natica

Umbilicus closed by a solid callous pad
• Shell uniformly white
Height 20 mm. Bering Sea to San Diego ....clausa
• Shell yellowish white, faintly banded
Height 14 mm. Esteros Bay to Gulf of Calif. .... salimba
Umbilicus more or less open
• Shell obliquely depressed
•• Whitish, closely longitudinally lined with chestnut
Diam. 35 mm. Lower Calif. to Ecuador .... elenae
• Shell oblong or globose
•• Surface with fine axial or spiral striations only
••• Brownish, a white band on upper part of whorls
Height 20 mm. Gulf of Calif. to Peru .... unifasciata
••• Yellowish brown, without color markings in the adult
Height 20 mm. Bay of Panama .... othello
••• Peru .... undata
• Entire surface with axial plications
•• Fawn color, with 3 articulated dark chestnut bands
Gulf of Calif. to Ecuador .... broderipiana
• Axial plications between shoulder and suture only
•• Fawn color, with 3 mottled white bands
Height 18 mm. Gulf of Calif. to Panama .... catenata
•• Pale brown, with 3 obscure pale bands
Height 17 mm. Bay of Panama .... scethra

Genus Polinices

Umbilicus more or less filled with callus
• Shell depressed
•• Whitish or broadly chestnut banded
Diam. 50 mm. Lower Calif. to Peru .... glauca
•• Milk white, with obsolete spiral lines
Diam. 9 mm. Galapagos ....littorinus
• Shell oval to globose
•• Whorls flattened
••• With an orange colored subsutural band
Height 35 mm. Lower Calif. to Peru .... otis
••• Unicolor, not banded
•••• Umbilical callus white
Height 75 mm. Crescent City to Chilo .... recluziana
•••• Umbilical callus purplish brown
Height 40 mm. Monterey to Newport Bay .... alta
•• Whorls quadrangularly compressed at the sides
Height 50 mm. Panama ....panamensis

(con.)

.. Whorls rounded, convex

... Umbilical callus purplish

.... Shell pyriformly ovate, white, solid

Height 35 mm. Gulf of Calif. .... unimaculata

.... Shell ovately globose, bluish or bluish white

Height 35 mm. Galapagos to Peru .... atracyansis

... Umbilical callus white

.... Shell oblong turbinate, white, solid

Height 35 mm. Gulf of Calif. to Peru .... uber

.... Similar but with a persistant epidermis

Galapagos to Peru ....philippianus

.... Shell ovate, body whorl slopingly shouldered

Pwru .... alveatus

.... Shell rounded, ellipsoid, dirty milk white

Height 12.5 mm. Alaska to San Diego .... caurinus

.... Shell globose

..... Shell large, thick and heavy

Peruand Chile .... dubia

..... Shell small, rather thin

...... Shell polished, white

Height 12 mm. Chile .... streboli

...... Epidermis minutely spirally banded

Height 16 mm. Monterey to Coronado Islands......acosmitus

Umbilicus without an entering callus

. Umbilicus large, funnel shaped or cylindrical

.. Whorls with a flattened band at the posterior third

Height 100 mm. British Columbia to Newport Bay ..... lewisii

.. Whorls obliquely flattened below the sutures

Height 28 mm. Ecuador to Peru .... ravida

.. Whorls flat topped, translucent white

Height 26 mm. Panama to Peru ....agujanus

.. Whorls rounded, convex

... With faint indications of spiral threads

Height 50 mm. Alaska to Laguna .... draconis

... Surface smooth, white

Height 22 mm. Magellan Straits .... vaginatus

. Umbilicus narrow

.. Shell brownish, with ~~x~~ 2 narrow white spiral bands

hight 45 mm. Cape San Lucas to Acapulco .... bifasciata

.. Shell transparent white, flesh tinged

Height 13 mm. Galapagos .... glabella

.. Shell uniformly white

... Body whorl slightly elongated, wrinkled at suture

Height 15 mm. Panama and Galapagos ,,,,,,,,,,,,crawfordianus

... Whorls slightly flattened below the suture

Height 6 mm. Chile .... pisiformis

... Whorls constricted in front of sutures

Height 20 mm. Magellan Strait ....constrictus

... Whorls depressed, milk white /pa

Diam. 14 mm. Panama and Galapgos .... pedroanus

... Whorls evenly rounded, convex

.... Surface smooth, polished

Height 17 mm. Peru and Chile .... solutus

.... Upper half of whorls axially wrinkled

Height 8 mm. Alaska to San Diego .... canonicua

.. Shell large, white, with distant dark markings

Height 50 mm. Galapagos ....macrostoma

Genus Eunaticina

Sculptured with extremely fine wavy spiral striae
Height 35 mm. Oregon Coast to San Diego .... oldroydii

Genus Sinum

Adult shell over 20 mm. in diameter
. Shell white or waxen, inside and out
Diam. 38 mm. Monterey to Todos Santos Bay .... californicum
. Inside of shell brownish
.. Shell very flat, with a minute flattened apex
Diam. 25 mm. Catalina to Gulf of California .... debile
.. Shell moderately elevated
Diam. 50 mm. Panama to Peru ....concavum
Adult shell less than 10 mm. in diameter
. White, sculptured with sharp spiral grooves- shell suborbicular
Diam. 6.5 Catalina .... keratium
. Grayish white, sculpture microscopic- shell depressed
Diam. 9 mm. Catalina to Panama ....pazianum

Genus Elachasina

Sculptured with fine, uniform striae
Height 3 mm. San Diego .... grippi

Genus Natica Scopoli,1777.

Natica (Cryptonatica) salimba Dall,1919.	Esteros Bay to Gulf of Calif.
Natica (Cryptonatica) clausa Brod. & Sby., 1829.	Bering Sea to San Diego
Natica chemnitzii Pfeffer	Gulf of Calif. to Peru
var. unifasciata Lamarck	
Natica broderipiana Recluz,1847	Cerros Isl.,Gulf of Calif. to Ecuador
Natica catenata Philippi,1851	Gulf of Calif. to Ecuador
Natica elenae Recluz,1843	Lower Calif. to Ecuador
Natica idiopoma Pilsbry & Lowe,1932	Nicaragua
Natica undata Philippi,1852	Peru
N. (Cochilis) othello Dall,1908.	Bay of Panama
N.(Cochilis) scethra Dall,1908.	Bay of Panama
Natica colima Strong and Hertlein,1937.	West Mexico

Genus Polinices

P.(Euspira) pallidus (Brod. & Sby.),1829.	Arctic Sea to Cortez Bank
P. (Euspira) lewisii (Gould),1847.	British Columbia to San Pedro
P. (Euspira) caurinus (Gould),1847	Puget Sound to San Biego
P. (Euspira) draconis Dall,1903.	Alaska to Laguna
P. (Euspira) acosmitus Dall,1919	Monterey to Coronado Islands
P. (Euspira) canonicus Dall,1919.	Alaska to San Diego
P. (Euspira) agujanus Dall,1908	Panama to Peru
P. (Euspira) pardoanus Dall,1908.	Panama and Galapagos
P. (Euspira) litorinus Dall,1908	Galapagos
P.(Euspira) crawfordianus Dall,1908.	Panama and Galapagos
P. (Euspira) solutus (Gould),1847	Peru and Chile
P. (Euspira) pisiformis (Recluz),1843	Chile
P. (Euspira) strobeli Dall,1908	Chile
P. (Euspira) constrictus Dall	Magellan Straits
P.(Neverita) recluzianus (Deshayes),1839	Crescent City to Chile
P. (Neverita) alta Dall	Monterey to Newport Bay
P. (Neverita) glauca (Lesson),1826	Lower Calif. to Peru
Polinices otis Broderipand Sowerby,1829	Lower Calif. to Peru

(con.)

Polinices uber Valenciennes,1833	Gulf of Calif. to Peru
Polinices intermorata Philippi,1857	Gulf of Calif. to Panama
Polinices bifasciata (Gray)	Gulf of Calif. to Acapulco
Polinices unimaculatus Reeve	Gulf of Calif.
Polinices panamensis (Recluz),1843	Panama
Polinices philippianus (Nyst),1845	Galapagosand Chile
Polinices ravidus (Eydoux & Souleyet),1852	Ecuador to Peru
Polinices alveatus (Trochel),1852	Peru
Polinices dubius (Recluz),1843	Peruand Chile
Polinices rupulumlima Pilsbry,1933	Panama
Polinices macrostoma (Philippi),1852	Nicaragua and Galapagos
Polinices glabella (Reeve),1855	Nicaragua and Galapagos
Polinices crickmagi Palmer and Hertlein	Galapagos

Genus Eunaticina Fischer,1855

Eunaticina oldroydii Dall,1897	Oregon to San Diego
Eunaticina heimi Hordan,1936	Galapagos

Genus Sinum Roeding,1798.

Sinum californicum Oldroyd,1917.	Monterey to Todos Santos Bay
Sinum debile Gould,1852	Catalina to Gulf of Calif.
Sinum pazianus Dall,1919	Catalina to Panama
Sinum keratium Dall,1919	Catalina
Sinum concavum (Lamarck),1822	Panama and Chile
Sinum noyesii Dall	Nicaragua to Panama
Sinum sanctijohannis Pilsbry & Lowe,1932	Nicaragua

Genus Elachisina Dall,1918.

Elachisina grippi Dall,1918.	San Diego

Family Naticidae

Genus Natica Scopoli,1777. Type (by subsequent designation, Harris, 1897), Nerita vitellus Linnaeus (Natica rufa Born of authors). fide Woodring,1928, p. 377.

" Shell oval globular, porcellanoud,solid,generally smooth, covered by a fine epidermis, which is transparent, and generally not very persistent; umbilicated, or umbilicus more or less filled with callus; aperture semilunar, vertical, the outer lip simple. Operculum large, semilunar,paucispiral, corneous or calcareous." (Tryon, Manual of Conchology).

Subgenus Natica s.s. Not represented north of San Diego- N. unifasciata Lamarck.

Subgenus Tectonatica Sacco,1890. Type (by monotypy), Natica tectula Bonelli.

" Shell globose; umbilicus entirely filled with a callus deposit; operculum externally smooth".

* Note- Dr. Dall placed them all under Cryptonatica Dall,1892.

Natica clausa Broderip and Sowerby,1829. Arctic and Bering Seas, south in gradually deepening water, to Japan on the west and San Diego, Cal if. on the east. (Dall). Type locality not given. Johnson gives the Atlantic range " Labrador to off North Carolina in 16-1537 fathoms."

Collecting data: San Nicholas Island (Lowe); Bear Bay, Peril Straits,

(con.).

Alaska (Kate Stephens); Port Graham,Alaska (Baker); Spitzbergen and Tronso, Norway (Capt. Andrews) (San Diego Museum); Monterey Bay, 389-871 fms. (U.S.F.C.) (A. Smith); W.J. Eyerdam reports from the following stations, Puget Sound, Wash.; Kola Fjord,Russia,1928; Izhut Bay, Afognak Id., Alaska, 19 22; Drier Bay, Knight Island,1923; Sitkalidak Island, Kodiak Islands; Raspberry Id.; Hinchinbrook Id., Pr. Wm. Sound; Unalaska Island,Aleutians; Unimak Id.; Akutan; Atka; Ugamik Bay, Kodiak Ids.; Uyah; Tromsodund,Norway (Norberg); Gulf of Kronotski,Kamchatka; Tsuruga Bay, Japan; Mr. Eyerdam comments on the species as follows: " The specimens from N. Europe are mostly what we have been calling N. russa. The northern race should retain the name of aleutica at least as a subspecies because it grows so much larger. I have specimens taken alive that I collected at Unimak Island 2½ inches high. The specimens from Iceland are like some of the small forms of Natica aleutica from Izhut Bay and Ugamik Bay. Those from Kola Fjord, Russia and Tromso Fjord, Norway are the small brown, rusty colored form that we generally call russa, but may be the more typical European Natica clausa inasmuch that the different lots have been classified by that name by four of the best authorities on N. European marine shells, namely Odhner of Riksmuseum,Stockholm, Hindholm, the late director of the Academy of Science, Lehingrad, Hans Schlesch of Copenhagen and Soot-ryen, director of Tromso Museum, Norway. The specimens that I collected in Tsuruga Bay, Japan, merge into Natica ianthostoma but lack the violet color inside the aperture. I am still at a loss as to what is really Natica clausa as it is also closely related to several other so called species. If any competent member of the shell club wishes to make a more thorough investigation of the status of N. clausa and desires to use my rather large series I shall be glad to loan them.

Natica russa Gould,1859. Bering Strait to Forrester Island, Alaska. to Puget Sound (Dall).

There has been no end of confusion about the above two species. Mr. Willett was of the opinion that many recorfs of clausa should be for russa. Dr. A. Myra Keen in Abridged Check List confines the range of clausa to the north and gives the range of russa south to San Diego. Grant and Gale state of russa " ... attains a larger size than Natica clausa. It also has a distinctive brownish color and a larger callus plug than Broderip and Sowerby's species with which it has undoubtedly been confused. Mr. Willett of the Los Angeles Museum has a series of N. russa which well illustrates the uselessness of the name aleutica."

However, I have a large set labelled N. aleutica Dall,1919 collected by Mr. Eyerdam from Unimak Island, Aleutian Islands and they certainly seem different to me from the shells I have as russa. I have large sets of clausa from the Atlantic and nothing else I have looks like they do. And Mr. Willett personally identified some specimens from the Pleistocene of Timm's Point as russa that certainly could never be connected with the shells above mentioned labelled aleutica. (Burch).

Dr. A. Myra Keen writes (Per. Comm. Nov. 1945) " Some years ago I sent Mr. Willett my only duplicate print of a National Museum photograph of Natica russa Gould. In his next letter he commented that this was not the shell he had been calling russa, that it was something he had never seen before, and that he would recommend the adoption of aleutica again. Perhaps Dr. Hill can locate this print for you. * Note* We will run a photo of this print on one of our forthcoming plates.*

Concerning this shell I made the following notes at the National Museum. " Natica Russa Gould. No. 188401, Jeffreys Collection , U.S.N.M. The holotype is lost; this specimen is a topotype collected by Stimpson in Behring's Straits and sent by Gould to Jeffreys. Dr. Dall(s discussion (Proc. U.S.N.M

(con.)

56, p. 352) might be construed as designation of the specimen as neotype. At any rate it is definitely not the russa of West Coast collections. The specimen is very thin, with wavy concentric striation. The aperture is high and narrow, the umbilicus closed. The operculum is calcareous, not polished or shiny on the exterior face."

Natica aleutica Dall,1919. North end of Nunivak Island, Bering Sea; south on the west from Kamchatka to Japan; on the east to the Aleutian chain and Puegt Sound. (Dall). Type locality, Unalaska,Aleutian Islands.

See discussions under N. clausa and N. russa. The final consensus of opinion is that this is a good species. Figures will appear on one of our plates in the near future.

Natica affinis Gmelin,1792. Arctic Ocean north of Bering Strait. Also Greenland.

Dr. A. Myra Keen advises on this species and the next as follows (Per. Comm. Nov. 1945) " I omitted N. affinis and janthostoma because they are outside our area. The " an bujus tribus" is a misprint for " an hujus tribus" and should have been left out of the locality description by Mrs. Oldroyd, as it is Gmelin's comment on systematic position of the species; he says in effect that he does not know its affinities."

Natica janthostoma Deshayes,1841. Commander Islands, Bering Sea; Kamchatka and south to Japan. (Dall). Type locality, Kamchatka. Figured in Bull. 112.

Collecting data: Sets in the San Diego Museum of Natural History from Japan and Notoro Bay, Hokkaido from Dr. Fred Baker; Mr. W.J. Eyerdam writes " I have collected this species in the Gulf of Kronotski, and at the mouth of the Kamchatka river, Kamchatka, also Attu Island, Bering Island and in Tsuruga Bay, Japan. It has a deep violet coloring in the aperture and the umbilicus has a curved slit while in N. aleutica or N. clausa it is closed. There is no readon for skipping this one as it is a distinct species. "

Natica salimba Dall,1919. Off Esteros Bay, California, and south to the Gulf of California in deep water. (Dall).
Type locality, between Santa Barbara and San Nicholas Island, Calif. in 216-339 fms.

Collecting data: Off Redondo Beach, Calif. in 100 fms. mud bottom.(Burch). Catalina Island in 30 fms. (Lowe).

Natica sp. Off Redondo Beach, Calif. in 150 fathoms. (Burch).

Genus Polinices Montfort,1810. Type (by original designation), Polinices albus Montfort (= Helix mamillaris Linnaeus,1767).

" Shell oval or suboval, solid, smooth, spire short, sharp; aperture semicircular, inner lip oblique, callous, the callus extending into the umbilicus. Operculum corneous. Color usually white, sometimes colored but not banded or spotted." (Tryon, Manual of Conchology).

Subgenus Euspira Agassiz in Sowerby,1838. Type (by subsequent designation, Dall,1908,1909), Natica glaucinoides Sowerby, not Deshayes (= Natica labellata Lamarck). (fide Grant and Gale, p. 803).

" Shell globose; spire moderate; outer lip straight, slightly retracted to suture, inclined about 30 degrees from vertical; inner margin with light callus on parietal wall; umbilicus open and without any funicle; operculum horny." (Marwick).

Polinices pallidus Broderip and Sowerby,1829. Arctic Ocean at Point Barrow and southward on the east to Forrester Island, Alaska. On the west at the Island of Kolguief in the Polar Sea and in the Okhotsk Sea.(Middendorff) south to Redondo Beach, Calif. in 100 fathoms. (Burch).

Collecting data: The specimens we dredged off Redondo Beach in 100 to 150 fathoms were identified as this species by Mr. George Willott who had collected it extensively in the north. (Burch); Izhut Bay, Afognak Id.; Friday Harbor, San Juan Islands, Wash.; Tromso,Norway; Hinchinbrook Id., Pr. Wm. Sound, Alaska (W.J. Eyerdam); Orcas Island, Puget Sound in 10 to 30 fms. (Dr. F. Baker); Ellamar Island, Alaska (Dr. Baker); San Juan Islands (Oldroyd); Katz Is.,Cape Espenberg,Alaska (Lowe); Forrester Island,Alaska (Willett).

Type locality on advice of Dr. A. Myra Keen is Icy Cape.

Polinices gronlandica (Beck) Moller,1842. Arctic Seas southward in gradually deeper water to Monterey, Calif. Also Greenland.
Type locality, Greenland.

Collecting data: Petersburg,Alaska (George Willett); Izhut Bay, Afognak Id., Alaska,1922; Victoria,B.C. (Eyerdam); Point Barrow, Alaska (Brower) Wrangell,Alaska in 50 fms. (Willett); Dogger Beach, North Sea; Swedén; (Nat Hist. Mus. of San Diego); 296 fms. off Pt. Ano Nuevo,121-766 off Pt.Pinos(USFC)

Polinices ācosmitus Dall,1919. Monterey to Coronado Islands in deep water.
Type locality, off Monterey Bay, Calif.

Collecting data: Dredged off Redondo Beach, Calif. in 100 fms. mud bottom (Burch); 627 fms. off Pt. Pinos (USFC) (A. Smith);

Polinices monterona Dall,1919. Arctic Ocean, Bering Sea, and the Aleutians. Type locality, Captain's Bay, Unalaska in 75 fms. / to Drier Bay, Pr. Wm. Sound, Alaska,1923 (Eyerdam).

Polinices algidus Gould,1848. Coal Harbor, Shumagin Islands, Alaska to Puget Sound. Type locality " Rio Negro" (Gould).

Polinices politianus Dall,1919. Petrel Bank, Bering Sea.
Type locality, in 600 fathoms.

Polinices caurinus Gould,1847. Norton Sound, Alaska to Puget Sound, and in deep water (822 fathoms) to San Diego, Calif.
Type locality, Straits of Juan de Fuca. Monterey Bay in 278-581 fms. (USFC)

Polinices cananonicus Dall,1919. Off Alaska Oeninsula in 1,365 fathoms and off San Diego, Calif. in 822 fathoms. (Dall).
Type locality, off San Diego in 822 fathoms.

Polinices lewisii (Gould),1847. Duncan Bay, British Columbia to Todos Santos Bay, L.C. (Burch). Type locality, Puget Sound.

Collecting data: This abundant species found in our experience in every estuary on the coast. They are particularly abundant during the summer months. It seems odd that all of the published records for the range should stop at San Diego or even farther north when Todos Santos Bay, L.C. abounded with them. We even picked up a number in our dredged off Ensenada,Mex. in 10 to 15 fms. The bathymetric range is not great but they seem to be common enough down to 25 fms. or a little deeper off Monterey, Pacific Grove, Redondo Beach, Catalina Island etc. One item of possible interest is that only by dredging in our experience do you get the very young. We have series of them from the size of a sugar bowl down to the size of a pin head all off Redondo Beach.

The very young give some study when first seen. Not uncommon in the San Pedro Pleistocene.(Burch); " This is the largest species in the world of the family Naticidae and seems to reach its maximum size in Puget Sound where it is very common. Although its sand collar egg cases are very common on the mud flats I have never seen any of the very young. This species reaches a maximum height of 5 inches." (W.J. Eyerdam); San Quintin,L.C. (Fortiner); Scammons Lagoon (Capt. Porter); Mission Bay (E.N. Wilson); Olympia,Wash. (Hemphill); Del Mar (Bristol); Monterey 0 to 25 fms. (A.G. Smith).

Polinices draconis Dall,1903. Port Althorp, Alaska to Todos Santos Bay,L.C. Type locality, Drakes Bay, Calif.

Collecting data: In our experience this is a much rarer species than lewisii. It seems to be almost entirely a deeper water species. We have dredged it off Monterey; off Redondo Beach in 25 fms.; off Avalon,Catalina Island in 25 fms.; off Ensenada,Mex. in 15 fms. The fun commences with sorting out a box of the very young of this species and lewisii mixed. Separation of the adults is a simple matter but their young are amazingly alike. It can be done though.(Burch); Newport (Lowe); Del Rey (Lowe); Drakes Bay and also Catalina Island (Lowe); 12 to 50 fms. in Monterey Bay (A.G. Smith).

Polinices uber Valenciennes,1833. Mission Bay, Calif. south to Peru.

Dr. Joshua L. Baily Jr. adds this southern species to the California fauna (Per. Comm., Nov.,1945) " Polinices uber has been found in False Bay. Maxwell Smith has a specimen- also Miss Mary Williams got one. Her collection I believe is at Pomona College."

This species is possibly in the subgenus Polinices s.s.

Subgenus Neverita Risso,1826. Type (by monotypy), Neverita josephina Risso.

" Shell ovate; sutures tangenital, appressed; apertural callus thick, coalescing with a huge funicle, which fills the umbilicus; aperture greatly inclined." (Marwick).

Polinices recluzianus (Deshayes),1839. Crescent City, Calif. south to Tres Marias Islands, Mexico. Type locality, Mers de Californie.

Reference: Pilsbry, H.A., " Neverita reclusiana (Desh.) and its Allies", Nautilus 42:109-113, pl. 6, figs. 1-9, April,1929.

Dr. Pilsbry discusses this group very thoroughly and figures them well. In this paper he suggested a new subgenus or section of Neverita to be called Glossaulax, with recluzianus as type.

Collecting data: The common typical form of this species needs no discussion. It is found in all estuaries in southern California as well as the open coast. We have dredged it in as deep as 25 fms. but it is not a deep water species. (Burch).

Mr. A.G. Smith comments on the published ranges of this species and the following " We have not found it at Monterey and would be inclined to look with considerable suspicion on all records north of Pt. Conception, as this is a warm water shell". * Mr. Smith's observation coincides both with our experience as well as with all of the collecting records submitted.

Polinices recluzianus imperforatus ' Stearns' Dall,1909. Crescent City to San Diego.

The original description of this subspecies as reprinted in Oldroyd is so inadequate that it is impossible to figure out exactly what it is. Dr. Pilsbry in the paper mentioned above discusses it as follows: " In shape

(con.)

the shell is smaller and generally more depressed than recluziana, but it varies to forms equally high. The parietal and umbilical callus is white, or there may be a faint brown tint toward the outer margin; old ones have a brown streak on the callus contiguous to the posterior part of the outer lip. The callus covers the umbilicus typically, a s ig fig.4, but in some samples the closure is not complete, a small shallow or deep pit being left open. The shell is smaller than recluziana, the diameter usually 30-40 mm., but sometimes it reaches a larger size. Some apparently adult shells are much smaller, down to about 20 mm. diameter. " The Pleistocene specimen figured by Arnold and those sent by Woodring from Pacific and Oliver Sts., San Pedro, are small and agree with the living shells from Newport."

It seems to be the opinion of the majority of west coast collectors that this variety is of little consequence, and we have been placing all such specimens in the synonymy of the typical.

Polinices altus Arnold,1903. " The Paleontology and Stratigraphy of the Marine Pliocene and Pleistocene of San Pedro, Calif.", Arnold, Ralph, Stanford University,1903, p. 315.

Range: Monterey to San Diego.

Arnold merely mentions that Dall had described such a form. He does not say where or when. Dall in 1909 in U.S. Geol. Survey, Prof. Paper 59, p. 88, gives a brief description and this reference has been generally used and is reprinted by Mrs. Oldroyd.

Dr. Pilsbry at the suggestion of H.N. Lowe in the paper referred to above in the Nautilus considers alta a distinct species and not a subspecies. He discusses it at length and figures it. He says of it in part " In the Recent specimens the umbilicus varies in size but is always partially open and deep. The umbilical callus is brown (rarely pure white). The callus in some specimens, such as those figured from Newport, pl. 6, figs. 5,6, is long and tongue shaped at the end. In others, pl.6, figs. 7,8,9, Alamitos Bay, it has the usual shape of N. recluziana. Such variations are seen in our eastern N. duplicata...."

Collecting data: There are times when this form seems to come into the estuaries from deeper water. We have seen, for example Mugu Bay, Ventura Co. when all specimens collected were altus. Our experience has been not to find altus and typical recluzianus together to any extent. They are easily separable and in my opinion altus is a good name, but whether or not it is a species or a subspecies I do not know. I have seen no obvious intergrades. (Burch); San Diego Bay (Baker and Emery); Mugu Bay (Lowe); San Pedro and Long Beach (Lowe); Newport Bay and Morro Bay (Lowe); Ensenada (Lowe); Redondo (Tremper) (San Diego Museum).

Dr. Joshua L. Baily Jr. comments on the above species as follows (Per. Comm., Nov. 1945) " The two varieties of P. recluziana,alta and imperforata suggest a peculiar problem. Alta is distinguished by an elevated spire, imperforata by a large callus which completely fills the umbilicus. What should we call a specimen that has both an elevated spire and a completely filled umbilicus ? Since alta is now generally considered a good species and imperforata is not considered even a good variety, such a form as I have hypothecated would be considered a variety of alta. But if alta and imperforata had happened to be varieties of equal rank, my hypothetical form (which apparently does'nt exist) would have to be given a new varietal name, or else be considered to belong simultaneously to two varieties. And whenever two varieties based on independent characteristics are assigned to the same species, a potential third variety is implied. If three such varieties are assigned to the same species, there are four potential varieties, and in general, if n independent varieties are assigned to the same species the num-

-ber of hypothetical postulated varieties is given by the formula 2 n _(n-1) When a large number of varieties are assigned to a single species collectors ought to be on the lookout for these hypothetical forms. If they do not occur with reasonable frequency a problem for the geneticist is indicated."

Subgenus Polinices s.s.

Polinices nanus (Moller),1842. Arctic Ocean to the Aleutians and southward in gradually deeper water to near San Diego, Calif. (640 fathoms). Also Greenland.

There is a set in the San Diego Museum of Natural History from Aberdeen, Scotland in the Dr. F. Baker Collection.

Genus Sinum Roeding,1798. Type (by subsequent designation,Dall,1915) Helix haliotoides Linnaeus.

" Shell ear-shaped or naticoid, spire small, low; body whorl rapidly enlarging, with a very large aperture; sculpture consisting of fine revolving grooves, sometimes crossed by curved growth lines; operculum small, horny, subspiral."

Sinum scopulosum (Conrad),1849. U.S. Expl. Expd. Geol. p. 727, pl.19, figs 6,6a only,1849. (Sinum californicum Oldroyd,1917).
Range: Monterey to Todos Santos Bay. Type locality: Miocene of Astoria, Oregon. Type locality of S. californicum is San Pedro.

Collecting data: Mugu, Ventura Co.,Calif.; Newport Bay; Estero de Todos Santos Bay, L.C.; Mission Bay, San Diego Co. (Burch); Monterey (Mrs. Fackenthall) (A.G. Smith).

Sinum debile (Gould),1853. Catalina Island, Calif. to Gulf of Calif. Type locality, La Paz, Lower Calif.

Grant and Gale state " This species has a very flat shell, which is much smaller than mature shells of scopulosum."

Collecting data: San Felipe, La Paz and Kino Bay (H.N. Lowe Coll.) ; Dr. Joshua L. Baily Jr. reports " We have two distinct species of Sinum in False Bay- S. debile, which resembles S. perspectivum of the east coast, and another with a more inflated shell which I take to be scopulosum."

Sinum pazianum Dall,1919. Catalina Island, Calif. to Panama. Type locality, off La Paz in 26½ fathoms. Figured in Oldroyd.

Sinum keratium Dall,1919. Catalina Island, Calif.

Genus Eunaticina Fischer,1855. Type (by monotypy), Natica papilla Gmelin.

" Shell umbilicated, oval oblong, thin ventricose; spire sharp; inner lip straight, thin anteriorly, with a median callus." Tryon, Manual of Conch.

Eunaticina oldroydii Dall,1897. Oregon to San Diego, Calif. Type locality, off Catalina Island, Calif.

Collecting data: Off Monterey, Calif. in 50 fms. mud bottom (Burch); Monterey Bay 30 to 70 fatgoms (A.G. Smith);

Genus Elachisina Dall,1918. Type (by monotypy), Elachisina grippi Dall.

" Shell minute, elevated, with naticoid spiral sculpture,umbilicate." (Dall).

Elachisina grippi Dall,1918. Off San Diego,Calif. in 16 to 20 fms.

Genus Bulbus Smith,1838. Type (by monotypy),Bulbus smithii Smith. Dr. A. Myra Keen advises on the taxonomy of this genus as follows " As nearly as I can make out without seeing the original reference, Bulbus should be cited as of Smith,1838, with type by monotypy, Bulbus smithii 'Brown' Smith.

" Shell globular, spire very short; columellar margin incurved, columella twisted; lip fragile." Tryon, Manual of Conchology). This is the description of Acrybia H. & A. Adams,1853.

Bulbus apertus (Loven),1847. Icy Cape, Arctic Ocean, south to the Aleutian Islands and eastward to the Shumagin Islands. (Dall).

Dr. A.M. Keen advises on this species as follows: " B. apertus was described by Loven in 1847 and figured by Middendorff in 1851. The type locality is Finmark."

The original description of Natica aperta Loven (Ofversigt af Kongl. Vetens.- Acad. Forh. for 1846,1847, p. 149) is:

" A. congeneribus forma testae recedens,Sigaretum fere referens, N. flavae Gould affinis, testa rimata, tenui, pellucida, ovato-globosa; anfr. 4, untimo maximo, inflato; spira brevis, obtusa; apertura ampla, longitudinalis, ovata, postice, emarginata anfrantu penultimo; lamina columellaris tenuissima, supra umbilicum omnino tectum incrassata, effusa, revoluta , deinde sensim angustata, producta, et in labrum continuata, acutum, tenuissimum, arcuatum; operculum ignotum; 13.5 mm."

Genus Amauropsis Morch,1857. Type (by subsequent designation,Dall, 1909), Natica helicoides Johnson (= ? Nerita islandica Gmelin). fide Grant and Gale.

" Shell with canaliculated sutures. Scarcely distinct from Amaura."

Amauropsis purpurea Dall,1871. Arctic coast westward from Bernard Harbor, to Point Barrow and south to Plover Bay and Nunivak Island, Bering Sea. Type locality: St. Michaels, Norton Sound, Alaska.

Collecting data: Cape Simpson, Alaska (W.J. Eyerdam);

Family Vanikoridae

Dr. Joshua L. Baily Jr. comments on this name " Vanikoro is not a classical name, and is not Latinized. Perhaps that is why Cooke uses the name Narica instead."

Genus Megalomphalus Brusina,1871. Type (fide Fischer,1885), Megalomphalus azonus Brusina.

The systematic position of this group seems to be a matter of some difference of opinion. For example, Theile puts it in the family Fossaridae. But for that matter Theile also puts Iselica Dall,1918, which we have under Fossaridae, in the family Pyramidellidae and at that uses it as a section of another genus. We are trying to answer all such puzzles as these.

Megalomphalus californicus (Dall),1903. Santa Barbara Islands to San Diego (Stanford Coll.).

Type locality, Santa Barbara Islands.

Family Vanikoridae
Genus Vanikora Quoy and Gaimard

This genus is not represented in the California fauna but the following species are listed by Mr. Strong from the south.

Vanikora aperta (Carpenter),1864 Cape San Lucas to Acapulco
Vanikora insculpta (Carpenter),1865 Acapulco
Vanikora ctyptophila (Carpenter),1857 Mazatlan
Genus Choristes Carpenter,1872.
Choristes carpenteri Dall,1908. Acapulco to Panama
Genus Xenophora
Xenophora robusta Verrill,1870 Gulf of California

Genus Megalomphalus Brusina,1871. Type (fife Fischer,1885), Megalomphalus azonus Brusina.

Megalomphalus californicus (Dall),1903. Santa Barbara Islands to San Diego (Stanford Collection).

The following species are fromthe southern fauna.
Megalomphalus occidentalis Bartsch,1907. Magdalena Bay to Gulf of Calif.
Reported from San Felipe, Gulf of Calif.and from Mazatlan by H.N. Lowe.
Megalomphalus souverbiei de Folin Panama
Megalomphalus hancocki Strong and Hertlain,1939 Panama

Family Acmaeidae

The following genera are not reported from California but are from the southern fauna, as listed by Mr. A.M. Strong

Genus Patella
Patella mexicana Brod. and Sby.,1829 Gulf of Calif. to Peru
Patella magellanica Gmelin,1791 Chile to Magellan Strait

Genus Scurris
Scurria aeruginosa Midd. 1849 Gulf of Calif. to Peru
Scurria scurra (Lesson),1830 Peru
Scurria parasitica (d'Orbigny),1841 Peruand Chile
Scurria zebrina (Lesson),1830. Peru to Magellan Straits

Genus Acmaea Eschscholtz,1830
Acmaea limatula Carpenter,1866 Crescent City to Socorro Island
Acmaea digitalis Eschscholtz,1833 Aleutians to San Diego
Acmaea digitalis umbonata Reeve,1855 Alaska to San Diego
Acmaea digitalis textilis Gould,1846 Alaska to San Diego
Acmaea patina Eschscholtz,1833 Bering Sea to Socorro Island
Acmaea pelta Eschscholtz,1833 Bering Sea to Socorro Island
Acmaea pelta monticola Carpenter,1866 Monterey to San Pedro
Acmaea pelta olympica Dall,1914 Alaska to San Diego
Acmaea pelta nacelloides Dall,1871 Alaska to San Diego
Acmaea scabra Gould,1846 San Francisco to Socorro Island
Acmaea conus Test,1945 Point Conception to Cape San Lucas
Acmaea persona Eschscholtz,1833 Aleutians to Socorro Island
Acmaea atrata Carpenter Lower Calif. to Gulf of Calif.
Acmaea discors Philippi Gulf of Calif. to Clarion Island
Acmaea pediculus Philippi,1846 Gulf of Calif.
Acmaea fuacicularis Menke,1851 Magdalena Bay to Gulf of Calif.

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Acmaea mitella Menke,1847	Gulf of California
Acmaea semirubida Dall	Gulf of Calif. to Panama
Acmaea dalliana Pilsbry	Gulf of Calif.
Acmaea asmi Middendorff	Sitka to Socorro Island
Acmaea rosacea Carpenter,1866	Gulf of Georgia to Acapulco
Acmaea depicta Hinds,1842	Santa Barbara to Lower Calif.
Acmaea paleacea Gould,1851	Trinidad to Lower Calif.
Acmaea insessa Hinds,1842	Trinidad to Magdalena Bay
Acmaea triangularis Carpenter,1866	Sitka to Gulf of Calif.
Acmaea funiculata Carpenter,1864	Aleutians to Magdalena Bay
Acmaea variabilis Sowerby,1839	Panama to Chile
Acmaea vernicosa Carpenter,1865	Panama
Acmaea viridula (Lamarck),1822	Peruand Chile
Acmaea orbignyana Dall,1909	Peru and Chile
Acmaea araucana d'Orbigny,1841	Peru and Chile
Acmaea ceciliana d'Orbigny,1841	Chile
Acmaea coffae (Reeve),1855	Chile
Acmaea albescens Philippi,1846	Chile
Acmaea clypeater Lesson	Peru and south
Acmaea stipulata Reeve	Panama and south
Acmaea filosa Carpenter,1865	Panama
Acmaea subrotundata Carpenter,1865	Panama
Acmaea fonsecana Pilsbryand Lowe,1932	San Salvador

Genus *Lottia* Gray,1834

Lottia gigantea Gray,1834	Crescent City to Cerros Island

Genus Helcioniscus

Helcioniscus nigrisquamatus Reeve	Chile

* Note* Our discussion of the family Acmaeidae will be found in a later issue of the Minutes. *

C.E. Fox, Siota, Solomon Islands. The following letter from the Rev. Fox to Mr. W.J. Eyerdam contains some very interesting items. Excerpts from the letter follow: " Your letter of March 23 reached me June 4". " I received about a dozen letters from American Universities about my shells; but yours is quite different, with the ring of the real enthusiast...... My collection I sent to the U.S.A. Naval Museum. Many officers asked for it, and I wanted to show my gratitude to Americans for all I owe them (e.g. not getting shot). It had some rare and many beautiful shells which I may never get again, but I have begun again with the nucleus of some 600 duplicates remaining over, and am adding. Eventually it will go to Auckland Museum where they have a very good conchologist, A.W. Powell, who is going to identify for me. But if I get a chance I am going to send you some. Of course I know all Mala well and San Cristoval and Rennell (some days on the lake Onc) but not Choiseul (where there are still Japs). I envy you belonging to a Conchological Club. Any practical hint about collecting would be m most gratefully received. There must be something wrong about my tecnique as I have turned over idly with my foot many rocks without finding *gloria maris*. Yet that is the tecnique in Miss Rogers book.

As to land shells I'll remember you. I only found 4 *Placostylus* on N. Mala and never the beautiful green one of San Cristoval which the Mala men didn't know. I had already identified *Cypraea isabella* but of my 50 or so *Cypraea* only a few are identified. I am now after the blood red *Cypraea*

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of Mala, but it is deep and has to be dived for. What is it's name ? The natives are afraid of touching it because of its brilliant blood red color. Thanks for identifying the Voluta. I had 8 or 9 sp. of Pterocera, but have only 6 left and can only identify 2.

I tried raking as you suggest, but no results. Something wrong in my method.

I hope to get about a bit soon. My work is simply that of overseeing language work in the Mission and writing Dictionaries and Grammars. I wrote a dictionary of 30,000 words of Arosi (San Cris.) and am now doing Gela. But I have no fixed duties and can go about as I please. But you cant have left me many Solomon Island shells to collect. ....

What is?:

1. Pterocera with 10 fingers and deep purple lip .
2. " with 5 long very slender fingers, purple lip
3. " with thick massive fingers & horizontal striations- quite small
4. " with 14 fingers, medium size
5. Cypraea rather smaller than aurantium, more oblong & sharp pointed. massive, canary yellow
6. Cypraea small white with 3 broad coal black bands across it (brown in worn specimens).

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Jack Schmidt, 406 North K St., Lake Worth, Florida. Jack indicates his interest in purchasing if necessary a specimen or so of the species we list as Forreria catalinensis Oldroyd, as well as any of the west coast species of the genus Trophon. It is an interesting thing to puzzle about when we read the records of some of the collectors of thirty or forty years back, and note that they picked up this species ashore after storms around San Pedro etc. Mrs. Eshnaur had any number of them washed in on Terminal Island. And yet my personal experience with this species has been to bring it up from certainly deeper than 50 fathoms and this is definitely beyond the depth where even the most violent of storms will wash them ashore. Maybe they have just decided to move out into deeper water.

Mrs. Aurora Trethewey, 3796 4th Ave., San Diego 3,Calif. This is the new address of Mrs. Trethewey. She has moved from 1129 Alberta Place.

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S.L. Kimball, Master, Engineer Dredge Sacramento, Fleet Post Office, San Francisco, Calif." I have been receiving the Minutes of the C.C. of S. Calif regularly and they have been of gret interest to me and several members of my crew, but as I plan to be leaving here about Feb. 15th I request that from now on you send them to my home in Weaverville, Calif. P.O. Box 46 where I expect to remain from then on. My collection of shells from here at Okinawa is much bigger and better than from any of the other islands where we have been which includes Guam,Eniwetok,Johnston,Midway,Palmyra,Christmas and Oahu. You are doing a great job and I am sure there will be many new collectors added to your list in the near future. Hope to be seeing you early next summer."

Mr. A. Byron Leonard, University of Kandas, Department of Zoology, Lawrence, Kansas. We are pleased to add the above name to our subscription list. Mr. Leonard has done some excellent work in conchologyand we have several of his papers in our library at this time. We hope and expect to see more.

Lamellariidae Phasian
Velutinidae Turbini
Acmaeidae Liotidae
Crucibulidae Trochidae

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
February 1946

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, non-members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or $1.25 each six months.

We are now meeting the first tuesday of each month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, Calif.

Please maill all news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.
Phone Ax 2-7965

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Family Lamellariidae

Genus Lamellaria Montagu,1815. Type (fide Winckworth,1932) Lamellaria tentaculata Montagu (= Bulla latens Muller,1776).

" Shell internal, ear-shaped, thin pellucid; spire lateral, very small; aperture large, patulous, both lips regularly arcuated; axis imperforate. No operculum." (Tryon, Manual of Conchology).

Lamellaria sharonae Willett,1939. Nautilus 52:123,124, pl. 9, figs. 1,1a,1b.

Mr. Willett told a number of us while he was working on this species that he was not entirely satisfied that it should go under Lamellaria, but this seemed to be the only allocation available without describing a new genus for the species. It is certainly quite different from any of the other West Coast species of this genus.

Collecting data: We collected perhaps 100 specimens all in the same habitat. They were on yellow sponge growing on the bridge pilings in Anaheim Bay and in almost the same habitat in Newport Bay. A number of us carried this in our collections for several years before its description under a number of different names so all sets bearing unusual specific names of related genera should be checked for this species.

The range is confined to Anaheim and Newport Bays so far but surely it will be found elsewhere in similar places.

The original description was L. sharoni sp. nov. However, Dr. A. Myra Keen advises that the name should be emended to sharonae since it was named in honor of Mrs. Ruby Sharon.

The original description follows:

". Shell fragile, entirely internal, naticoid, inoperculate, imperforate; white, covered with a very thin, light pinkish epidermis. Aperture rounded below, the outer lip and columella merging to form three-fourths of an almost perfect circle. Outer lip thin meeting the body at an acute angle. Columella light brown, thin, regularly curved, with a shallow groove between it and the body whorl. Surface of shell marked by irregular growth lines and very fine spiral striations. Shell higher than wide, about the shape of some specimens of Polinices altus Dall, though very much smaller. Measurements of shell: Max. diam., 5.5; min. diam. 4.9; alt. 7.4 mm.: alt. 6; diam. 4.3 mm.

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Mantle of animal completely covering shell, roughly papillose, vinaceous rufous above, somewhat lighter below. In the center of the mantle, above, is a rather poorly defined hexagonal, flattish area,the diameter of which is about one-fourth the length of the animal. From each of the six angles of the central area a poorly defined ridge runs to the lower part of the mantle, each ridge being ornamented with from one to three dusky spots; also in the middle of the central area, and in each of the six areas between the ridges is a single black spot (Fig. 1b)."

" The naticoid form of this shell at once distinguishes it from Lamellaria stearnsi,diegensis,rhombica, or digueti, as well as from any other species of the group known to the writer. Of the subgenera usually placed under Lamellaria , it is probably closest to Marsenina or Coriosella in shell characters. The mantle, however, is not fissured."

Lamellaria stearnsii Dall,1871. Alaska to Tres Marias Islands (Strong & Hanna). Type locality, Monterey, Calif. Figured in Oldroyd.

Collecting data: In our experience this is by far the most common species of the genus and it is not common. We have taken it by pulling up holdfasts from a rowboat off Malaga Cove,L.A. Co.; a number of them collected on sponge under stones at Cayucos by Mrs. John Q. Burch. (Burch); Pacific Grove, Calif. (A.G. Smith); Crescent City (Chace); Monterey (Button); San Pedro (Lowe); Mission Bay (Mr. and Mrs. Ralph Bormann).

Lamellaria stearnsii orbiculata Dall,1871. Sannakh Islands, Alaska to Gulf of Calif. Type locality, Monterey, Calif. Also figured in Oldroyd.

Collecting data: We have labelled specimens with this name, but I see nothing important about collecting a dozen specimens in one spot and selecting the larger and more mature specimens for orbiculata and calling the rest of them just stearnsii. It is probable that I do not know the real distinctions if there are any. (Burch); "Agree that this subspecies has doubtful taxonomic value" (A.G. Smith);

/ to Pts. Penasco,Gulf of Calif.

Lamellaria diegoensis Dall,1885. San Pedro and the Islands to San Diego, Calif. Type locality, False Bay, near San Diego,Calif. (Mission Bay).

Collecting data: We have taken typical specimens from the type locality in Mission Bay (Burch); Mission Bay (Lowe); San Pedro (Lowe); Pta. Penasco (Lowe) (San Diego Museum).

Lamellaria digueti Rochebrune,1895. We are dropping this name from our faunal list. The matter was discussed under our work on Pleurobranchus. The error is obvious since Dr. Dall gives exactly the same reference even to page for both Pleurobranchus digueti and Lamellaria digueti. The consensus of opinion is that digueti is a species of Pleurobranchus.

Subgenus Marsenina Gray,1850. Type (by monotypy), Lamellaria prodita Loven.

Lamellaria rhombica Dall,1871. Neah Bay, Washington to Magdalena Bay, L.C. Type locality, Monterey Bay, Calif. Figured in Oldroyd.

Collecting data: Monterey (Oldroyd); Pacific Grove 0-15 fms. (A.G. Smith)

Genus Onchidiopsis Bergh,1853. Type (by monotypy): O. groenlandica Bergh. And in addition on this genus Dr. A.Myra Keen advises " I note that Dall proposes a subgenus Atlantolimax for O. hannai (Proc. Acad. Nat. Sci. Philadelphia for 1916, p. 376), type by original designation. " Adult with a large dorsal foramen in the notaeum." Whereas he describes Onchidiopsis s.s.

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as " Adult animal with an impervious notaeum."

Subgenus Atlantolimax Dall,1916. Type (by original designation), O. hannai Dall.

Onchidiopsis hannai Dall,1916. St. Paul Island, Bering Sea.

Onchidiopsis sp. Reported by Mr. W.J. Eyerdam from Drier Bay, Knight Island, Pr. Wm. Sound, Alaska,1923; and Raspberry Island, Alaska, on stones, 1945.

Family Velutinidae

Genus Velutina Fleming,1821. Type (by original designation and absolute tautonomy) Bulla velutina Muller. (Velutina vulgaris Fleming) = Helix laevigata Linneus.

" Shell thin, with a velvety epidermis; spire small; suture deep; aperture very large, rounded; peristome continuous, thin. No operculum." (Woodward).

Velutina rubra Willett,1919. Nautilus 33:25, July,1919. Forrester Island, Alaska.

The original description follows. This species was overlooked by both Dr. Dall in Bull. 112 and Mrs. Oldroyd.

" In life similar to V. cryptospira but animal bright vermillion in color (this color soon dissapears in alcohol). Shell smaller than that of cryptospira, rounder and with only a trace of spire. The type measures 13½ mm. in length by 9 mm. in breadth. This type together with four additional specimens were taken on Forrester Island by the writer. Three of these specimens were found at extreme low tide mark and the other two were dredged in 40 fathoms."

Velutina prolongata Carpenter,1865. Bering Strait to Monterey, Calif. Type locality, Neah Bay.

Collecting data: Forrester Island, Alaska (G. Willett); Mr. A.G. Smith advises on the Monterey record as follows " Dall's Monterey specimen in the U.S.N.M. looks like an abnormal V. laevigata according to Gordon. The Monterey record needs confirming. I specimen cf. prolongata from Little River, Mendocino Co."; San Juan Ids, Wash.(Eyerdam).

Velutina zonata Gould,1841. Icy Cape, Arctic Ocean to Monterey Calif. Also Atlantic. Type locality, Chelsea Beach, Massachusetts.

Collecting data: Puget Sound (Lowe); Mr. A.G. Smith comments " Dall's record is the only one reported south of the Pribilof Islands. I consider it doubtful for this northern species.";

Velutina laevigata (Linnaeus). Icy Cape, Arctic Ocean to Cayucos,Calif. San Luis Obispo Co. (Burch). Type locality not given.

Collecting data: Dredged off Monterey in 15 fms. shale bottom; San Simeon,Calif. at minus tide under rocks; Cayucos, Calif. in rocky rubble (Burch) Crescent City(Chace); Orcas Id. (Dr. F. Baker); Forrester Id. (Willett); Puget Sound(Button); Sweden(Anderson) (San Diego Museum); Izhut Bay, Afognak Island, Alaska,1922; Drier Bay, Knight Island, Alaska,1923;(Eyerdam); Monterey Bay 0-12 fathoms (A.G. Smith).

Velutina conica Dall,1886. Aleutian Islands eastward to Kodiak and south to Forrester Island, Alaska/ Type locality, Unalaska.

Velutina granulata Dall,1919. Monterey, Calif. in 55 fathoms.

Mr. A.G. Smith sent in the collecting record " 28-35 fms. off Pt. Pinos (U.S.F.C.). Known only from the type specimen."

Velutina coriacea (Pallas),1788. Bering Sea and the Okhotsk Sea.

Dr. A.M. Keen advises on this species " The type locality of Velutina coriacea (Pallas) is Kutile Islands. The reference given by Oldroyd is not quite accurate. It should be: Nova Acta Acad. Sci. Imp. Petropolitanae for 1784 (1788), vol.2, p. 243, pl.7, figs. 31-33."

Velutina cryptospira Middendorff,1849. Gulf of Alaska to Forrester Island, Alaska. Type locality, Shantar Island and northern Okhotsk Sea.

In Nautilus 33:25 Mr. George Willett comments on this species and his species rubra as follows: " I am very much averse to referring this and the next species to the genus Velutina, as in life they are so entirely dissimilar to laevigata, the type of that genus. In laevigata the shell is mossy and is, so far as I have seen, entirely bare, while in these two species the shell is smooth and completely covered by the animal. On the other hand, both the animal and shell differ markedly from the genus Lamellaria."

Collecting data: Forrester Island, Alaska (Willett); Gulf of Kronotski, Kamchatka,1925 (W.J. Eyerdam).

Velutina sitkensis A. Adams,1851. Bering Sea; Sitka,Alaska (Adams). Type locality, Sitka, Alaska.

Genus Torellia Jeffreys,1867, ex Loven MS. Type (by monotypy), T. vestita Jeffreys.

Torellia ammonia Dall,1919. Southwest of Sannakh Island, Alaska in 41 fms.

Torellia vallonia Dall,1919. Nazan Bay, Atka Island, Aleutians.

Family Lepetidae

Genus Lepeta Gray,1847. Type (by monotypy and original designation), Patella caeca Muller.

" Shell patelliform, the embryonic nucleus spiral, lost in the adult, apex in front of the middle; no internal septum."

Subgenus Cryptobranchia Middendorff,1851. Type (by subsequent designation, Dall,1870), Patella caeca var. concentrica Middendorff.

Dr. A.M. Keen advises that Dall's later substitute, Cryptoctenidia,1918, was unnecessary.

Dr. Joshua L. Baily Jr. comments on this matter (Per. Comm. Nov. 1945) " Cryptobranchia was discarded by Dall because Cuvier had used this name long before Middendorff. But Cuvier did not apply it to a genus, but to an order of equal rank with Pectinibranchia, therefore Middendorff's name is not preoccupied, and Dall was wrong in substituting Cryptoctenidia for it. His name falls into the synonymy of Middendorff's name."

" Apex inclined forward, the anterior terminations of the muscle-scar not in front of it. Surface not granulate; color whitish. Apex of rhacidian tooth tricuspidate, the cusps nearly equal; uncini spatulate." (Pilsbry).

Lepeta concentrica Middendorff,1851. Icy Cape, Arctic Ocean, on the west to the Okhotsk Sea and Shantar Islands, on the east to Forrester Island, Alaska (Dall). to Puget Sound (Oldroyd).

Type locality: Ohkotsk Sea.

Collecting data: Mr. George Willett in Minutes #18 stated " ... is rather

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common in moderate depths in Alaskan waters. The sculpture and proportions are quite variable in this species, and I doubt whether Lepeta alba is distinct from it. Its lighter color, inside and out, readily distinguishes it from most Acmaeas."

Mr. W.J. Eyerdam reports the species from Izhut Bay, Afognak Island; Drier Bay, Knight Island,1923; Sitkalidak Island,1931; Raspberry Island,1945 . Glacier Bay, Alaska (Kate Stephens); Bear Bay, Peril Straits and Windfall Harbor (Kate Stephens); Orcas Island, Puget Sound (Dr. F. Baker); Seward, Alaska (Dr. F. Baker); Drier Bay, Knight Island (Brown) (San Diego Museum).

* Note* In Minutes # 18: 3,4 Mr. George Willett discussed this genus in his paper " Some Limpet-like mollusks of western North America."

Lepeta caecoides Carpenter,1865. Arctic and Bering Seas to Hakodate,Japan, the Aleutian Islands and south to the Farallones Islands,Calif. (Dall). Type locality, Puget Sound and the Farallones.

Collecting data: Ixhut Bay, Afignak Island, Alaska 1922; Drier Bay, knight Island,1923; Evans Island,1924; Sitkalidak Island,1931; Thum Bay, Knight Island,1940; Raspberry Island,1945 (W.J. Eyerdam).

Lepeta alba Dall,1869. Bering Strait and Sea south to Fuca Strait. Type locality: Seniavine Strait and Plover Bay, East Siberia.

Collecting data: Sitkalidak Island, Alaska,1931; Raspberry Island, Alaska,1945 (W.J. Eyerdam).

Lepeta alba instabilis Dall,1869. Unalaska to the Shumagins and south to Sitka Sound, Alaska. Type locality, Sitka, Alaska in 10 fms.

Family Acmaeidae

No family group in our fauna has been the source of more differences of opinion than this one. Not only the identification of species but the taxonomy of the entire group has been in a state of confusion. When and if the problems are all settled the lists of synonymy will be long.

Mrs. Avery Grant Test was awarded her Ph. D. degree from the University of California in 1937 for her work on the genus Acmaea. Many of her conclusions have been passed among us more or less by word of mouth and have been rather generally accepted. Wesincerely hope that Mrs. Test's entire thesis will be published and made available for general use. Therefore, we feel some reluctance even in this informal discussion to quote Mrs. Test when such quotations are without having asked her permission and are at least in legal parlance " hearsay" and inadmissible.

Dr. A. Myra Keen advises on this matter: " Some years ago, when I was preparing the Abridged Check List, Mrs. Avery (Grant) Test gave me a list of corrected ranges and names for Acmaea which I found of great use, as she had given the group thorough study for her thesis (unfortunately not yet published). She indicated that she had arrived at the following classification, on the basis of study of radulae as well as shells:

Acmaea (Acmaea)
mitra,depicta,funiculata, sybaritica,
Acmaea (Collisella) Type, o.d, Dall,1881, Acmaea pelta)
asmi,digitalis,instabilis,limatula,ochracea,scabra,triangularis,cona
Acmaea (Patelloida)
fenestrata fenestrata, fenestrata cribraria, insessa,paleacea, persona, testudinalis (? - tessulata), scutum, testudinalis testudinalis,
Acmaea (Rhodopetala)
rosea

(con.)

Acmaea ??
rosacea

Genus Acmaea Eschscholtz in Kotzebue 1830. Type (by subsequent designation, Dall,1871), Acmaea mitra Eschscholtz.

" Shell conical, patelliform, apex more or less anterior. The shells may generally be distinguished from Patella by the different texture and margin border inside." (Tryon & Pilsbry, Manual of Conchology).

Dr. Joshua L. Baily Jr. comments on the type designation (Per. Comm.) " Dall did not designate Acmaea mitra as type of Acmaea, but merely stated that Philippi's designation was published, and I do not know where Philippi's designation was published and apparently no one else does, for I have never seen this species credited to any other author than Dall, except in Dall's own paper. If this designation by Dall is illegal- and I believe it is, the next designation must be used. I do not know what other designations have been made, but I believe there have been others, as Acmaea mitra was at one time believed to be a Scurria. If any student should decide that distinction between Acmaea s.s. and Colisella is of generic value the old familiar name Acmaea will have to be discarded, which would be very unfortunate."

Subgenus Acmaea s.s. Type: A. mitra Eschscholtz

Acmaea mitra Eschscholtz,1833. Pribilof Islands, Bering Sea south to San Martin Island,(Baker). Type locality, Sitka, Alaska.

Collecting data: Our experience with this species has been very interesting. Of course, we collected them in numbers from Puget Sound south to Cayucos, Calif. littoral with the numbers becoming fewer as we progressed southward. The species even in the north seems to be a little lower in the water than the rest of the littoral species. We were therefore quite amazed to bring up A. mitra in dredging off Redondo Beach from such a surprising depth as 75 fathoms. Another surprise came to us while collecting in and around Todos Santos Bay, L.C. We had been working the rubble reef at Punta Banda and collecting the warm water species, many of them either not recorded at all north of there or extremely rare- such things as Acanthina lugubris and Pallochiton languinosus. We decided to climb over the range of hills to the open sea on the outside of the bay at Arbolitos.When we stepped out on the rocky rubble at Arbolitos we could scarcely believe out eyes. The rocks were covered with Acmaea mitra and other northern forms. Placiforella velata was common on the rocks. Even the crustaceans reminded us that we were back to Monterey or farther north. The secret of the situation seemed to be that the shore dropped off abruptly to some depth resulting in an upsurge of cold water. Obviously temperature is more important to molluscan fauna than latitude. We took it from the backs of Haliotis rufescens at Morro Bay, and dredged it off Monterey most common around 20 fathoms. Not uncommon in the Pleistocene of Timm's Point, San Pedro. (Burch); " I have collected this species at many localities in Alaska and Puget Sound, always near low tide mark. It is often infested with peculiar knobby nullipores. Some of the largest are 1½ inches in diameter. I have a whole drawerfull showing many variations." (W.J. Eyerdam); Port Graham, Alaska (Baker) to So. Coronado Island (Baker) (San Diego Museum).

Acmaea funiculata (Carpenter),1864. Shumagin Islands, Alaska to Magdalena Bay, L.C. Type locality, Monterey, Calif.

Dr. G.D. Hanna and Allyn G. Smith were authors of a fine paper on this species in Nautilus 45:21-25, pl.2, July,1931.

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In this paper the authors establish the facts that funiculata differs from mitra anatomically and that it does belong in Acmaea which was at one time questioned. However, there is some difference of opinion about the above conclusions and this species is frequently placed in the synonymy of A. mitra.

Collecting data: Mr. George Willett dredged this species off Forrester Island, Alaska and also in the channel between Catalina Island and the mainland. We failed to dredge it locally but have fine specimens dredged off Monterey in 20 fathoms on the shale. (Burch); Catalina Island in 35 fms. (Lowe); Izhut Bay, Afognak Island, Alaska,1922; Raspberry Island,1945; Sitkalidak Island,1931 (W.J. Eyerdam).

Acmaea depicta (Hinds),1842. Santa Barbara, Calif. to Lower California on " Zostera". to lat. 27 (Keen). Type locality, San Diego, Calif.

Collecting data: Our experience has been to find this species comparatively rare in number of localities but exceedingly abundant where found. It is found on the broad leaved eel grass of the estuaries and in our experience never on the open coast. We have taken it in great numbers from the eel grass of Mission Bay, San Diego Co. and also from the Estero below Ensenada,Mexico. We found it in the dredgings of Newport Bay indicating that it has been there comparatively recently. However, we finally decided to label the Newport Bay specimens subfossil since no living member of the club could recall having taken a living specimen. It is not uncommon in the Pleistocene of Hilltop Quarry. (Burch); LaPlaya (Bristol); La Jolla (Orcutt); S. of Ensenada (Lowe);

Acmaea sybaritica Dall,1871. Plover Bay, Eastern Siberia, to Hakodate,Japan on the west; on the east from the Pribilof and Aleutian Islands to Chirikoff Island. (Dall). Type locality, St. George's Island, Pribilof Group, Bering Sea.

Acmaea aleutica Dall,1927. Nautilus 40:101. New name for A. apicina Dall, 1879. Pribilof, Aleutian and Shumagin Islands, Alaska.
Type locality: Chika Island, Akutan Pass.

Subgenus Patelloida Quoy & Gaimard,1834, Voy. " Astrolabe", Zool. III, p. 349. Type (fide Winckworth), P. rugosa Quoy & Gaimard.

Acmaea tessulata (Muller),1776. (A. testudinalis (Muller))
Range: Southern Bering Sea northward and eastward to the Atlantic.

The following data from Dr. A. Myra Keen (Per. Comm.) " Mrs. Test considered scutum to be a variety of the Atlantic testudinalis; she found that the typical varietu of the latter occurs on our coast, also. I note that Winckworth (Jour. Conch. vol. 19, 1932, p. 219) places testudinalis Muller in the synonymy of tessulata Muller,1776. According to Sherborn both names were used by Muller, Z. Dan. Prod., 1776, p. 237. I have not seen the original reference. Evidently the type locality (fide Dillwyn) is Norway. Mrs. Test gives the range on the American West Coast as Southern Bering Sea northward and eastward to the Atlantic. There are specimens in the Stanford Collection from Kodiak Island."

In the synonymy of this species we should no doubt place Acmaea emydia Dall,1914. Arctic Ocean and northern Bering Sea to Nushagak,Alaska and the Pribilof Islands, and Attu Island.(Dall). The original reference is Nautilus 28:14, June,1914 in which Dr. Dall under " recognizable mutations of A. patina

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" lists as follows"..; emydia Dall (the Arctic testudinalis of my 1871 paper) Figured and described in Am. Jour. Conch. v.6, p.249, pl.14, fig.3.
Dr. A. Myra Keen advises " Re emydia Dall. Apparently Mrs. Test inclines to Dall's 1871 view that the Arctic form is testudinalis Muller. Hence, she would synonymize emydia. The radula only was figured by Dall, Am. Jour. Conch. vol.6, p. 249, pl.14, fig.3,1871."

Acmaea tessulata scutum Eschscholtz,1833. Southern Bering Sea to Tugur Bay and the Shantar Islands on the west, and from the Pribilof and Aleutian Islands on the east south to the Gulf of California and Socorro Island.(Dall), Type locality, Sitka, Alaska.

Dr. Joshua L. Baily Jr. comments on the name scutum " Dall used Acmaea scutum instead of Acmaea patina , and Acmaea cassis instead of Acmaea pelta because the names he used had page priority. I reversed this usage and followed Carpenter, the first reviser of Eschscholtz's work, on the advice of Dr. Pilsbry."

There are among other described forms of scutum the following color varieties: A. patina Esch.ch.,1833; A. pintadina Gould,1846. The consensus of opinion is that they are of no consequence and should be in the synonymy.

Collecting data: " I have a great many lots of this species and its intergrades from Washington to Lamchatka, but have given up trying to name them exactly" (W.J. Eyerdam). Most of the rest of us will ditto these remarks.

Another form to be placed in the synonymy is A. scutum parallela Dall, 1914. Sitka, Alaska to Victoria, British Columbia on eel grass. The original description of this species amounted to a mere listing by Dr. Dall in Nautilus 28:14. In this paper he listed under " recognizable mutations of patina..." " and parallela Dall; the latter corresponding to the A. alveus of the Atlantic coast." I have a large set of this form collected by Mr. George Willett in 1936 at Ketchikan, Alaska. It seems to be obviously a situs form growing on eel grass. " (Burch.). Mr. Eyerdam reports taking it at Victoria, B.C.

Acmaea fenestrata fenestrata (Reeve,1855). Cayucos, Calif. south to Lower California.

Dr. A. Myra Keen writes on this problem as follows (Per. Comm.) " The International Rules provide that when an author bewtows several names simultaneously on what later is seen to be a single species, the desision of the first reviser as to the proper synonymy will stand. Mrs. Test found that the first person to recognize the identity of cassis and pelta chose the latter name; the first person to recognize the identity of patina and scutum chose scutum. For the cribraria-fenestrata tangle: she found that there is geographic as well as morphologic separation. From Sitka to Cayucos (lat 57 to 35) one find cribraria; southward of Cayucos one finds fenestrata. She said, as I remember it, that the principal difference is in the bluish tint of the interior."

The original description of A. fenestrata follows:
Patella fenestrata Reeve, March,1855. Conch. Icon. pl.38, sp. 120. Type locality, Upper California. Original English description: " Shell ovate, a little attenuated in front, rather thin, depressly conoid, apex prominent, rather obtuse, radiately densely finely striated, striae a little waved; greenish, finely tessellately mottled with ash-olive, interior bluish-ash, with a broad black border." (con.)

Mr. A.G. Smith commented on this species after having observed "Shells having a fine tesselated or " fenestrated" color pattern, with dark apex, which is whitish at the extreme tip".

Collecting data: Our experience with this species has been to find it rather scarce. We took large sets of them from the beaches north of Santa Monica and also at Dana Point, The habitat of the Santa Monica specimens was on large stones on and surrounded by sandy beach. (Burch).

Acmaea fenestrata cribraria Carpenter,1866. Alaska, Aleutian Islands south to Cayucos, Calif. Type locality " purchased in the Sandwich Isles."

Collecting data: We now have this matter neatly disposed of. If you get it from the townsite in Cayucos it is cribaria , but if it comes from across the channel on Morro Rock it is then typical fenestrata. (Burch). Mr. W.J. Eyerdam reports the species from: mouth of Speel River, S.E. Alaska, 1928; Unimak Island, Aleutians,1932; Raspberry Strait, Alaska,1945; Port Ludlow, Jefferson Co., Wash.

Acmaea insessa (Hinds),1842. Alaska south to Magdalena Bay, L.C. Type locality, San Diego, Calif. on seaweed.

Collecting data: Abundant from Monterey south to Todos Santos Bay in my experience and particularly abundant on the genus Egregia. However, we have taken it from other species of algae. The habitat is on the stalks or holdfasts of the algae.(Burch); Challam Bay, Strait of Fuca,Wash. (Eyerdam); San Simeon (Wilcox); Monterey (Orcutt); San Diego (J.M. Cooke); La Jolla (Beckwith and Bristol); Santa Barbara (Carl Hubbs); kelp barge from Carponteria to Summerland. (San Diego Museum)

Acmaea paleacea Gould,1853. Vancouver Island to Guadalupe Island (Strong). Type locality, Santa Barbara, Calif.

Collecting data: As distinguished from A. depicta of the estuaries, this species is found on the narrow eel grass (Phyllospadix torreyi Wats) of the open coast. It is particularly abundant in such localities as Dana Point, . Orange Co. and San Ohofre. We have it from Crescent City, Calif.to Todos Santos Bay. (Burch); No. Coronado Id. (F. Stephens); Crescent City (Chace); S. Coronado Island in 6 to 8 fms.(F. Baker); Laguna Beach (Lowe); La Jolla (Bristol and Orcutt); San Diego (J.M. Cooke).

Acmaea persona Eschscholtz,1833. Shumagin Islands, Alaska to Monterey,Calif. Type locality, Sitka, Alaska.

Dr. A. Myra Keen comments on this species and the subspecies following (Per. Comm. Nov.1945) " The paragraph from Tryon and Pilsbry in Oldroyd (vol. 2, pt.3, p.155) refers to digitalis, not persona, due to Carpenter's mididentification of persona."

" The taxonomic history of the name strigillata is complicated. In June 1864, Carpenter (Ann. Mag. Nat. Hist., ser. 3, vol. 13, p. 474) described Acmaea strigatella withthe type locality Cape San Lucas (description in Latin copied in Oldroyd, p.155, as strigillata). Carpenter comments, " This might be regarded as a cross between the northern forms A. pelta and A. patina about to change into the Gulf species, A. mesoleuca." In August,1864 ((Suppl. Rept. Brit. Assoc. p. 618) he referred to this description in the Annals and cited the page but erroneously spelled the name as " Acmaea strigillata." He mentions that the species also occurs at Margarita Bay. In 1866 (Am. Jour. Conch., vol. 2, p. 334) Carpenter described a new variety

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of Acmaea patina, var. strigillata, from a MS name of Nuttall's. No type locality was given other than Northwest Coast. After comparing it with the typical and with A. pelta he says " but young shells, with the outside abraded, are very difficult to determine or to separate from A. strigatella of Cape San Lucas; q.v. in Ann. Nat. Hist." Dall in Bull. 112 listing cites Carpenter's second 1864 usage and his 1866 usage, neither of which would seem to be valid. One is a typographical error, the other a homonym. If we recognize this form as varietally distinct, we must use the name strigatella However, I leave it to you collectors to decide on the biological validity of the form."

Collecting data: The large distinctive specimens of this species from the north need no comments. We have collected it around Puget Sound, Crescent City, Calif. etc. The only problem arises when you run into large specimens from middle California and wonder whether it should be labelled typical or the variety strigatella. There seems to be no question but that the two are separable if typical specimens from the north are compared with southern specimens. It seems to me that persona grades into strigatella with the latter the common form in southern California. (Burch).: " I have collected this species and varieties at many localities in Puget Siund and Alaska" (Eyerdam); Mole Harbor, Admiralty Islands, Alaska (Kate Stephens).

Acmaea persona strigatella Carpenter,1864. Monterey to Lower Calif.

Collecting data: Our common small southern California shell with the dark grey interior is my idea of strigatella. The theory being that persona is the northern form and strigatella the southern form of the same species. (Burch).

Subgenus Collisella Dall,1871. Type (by original designation), Acmaea Pelta Eschscholtz.

Acmaea pelta Eschscholtz,1833. Okhotsk and southern Bering Sea, Nushagak, Alaska, the Aleutian Islands south to Rosario Bay, Lower Calif. and Socorro Island (Dall). Type locality, Sitka, Alaska.

The following are thought by many including myself to be mere variations of a very variable species conforming to habitat: A. cassis(Esch.), 1833; A. nacelloides Dall,1871; A. monticola Carpenter,1866; A. olympica Dall 1914. There may be those of the opinion that the above or some of them are valid subspecies. I feel quite certain that the form we know as cassis being the rough stout ribbed one and nacelloides being either the kelp form or from stones after having started its life on the kelp, should be in the synonymy. It is possible that olympica , a small conical form which seems to be confined to a habitat commensal on Ostrea or Mytilus largely around Puget Sound may be a good subspecies. There are a number of other names such as hybridi Hemphill which seems to have been based upon a form suchas nacelloides but ubusually high. I have a set of pelta collected at Nemuro, Japan. They seem to be typical. (Burch). W.J. Eyerdam reports on this species as follows : " This species and many varieties are common on the rocks of Puget Siund and along the whole coast northward to Alaska and the Aleutian Islands. I have about 1000 specimens showing much variation. Lots collected by Eyerdam in Kamchatka and Japan seem to be typical. Acmaea olympica Dall,1914. I have several hundred paratypes from Olympia, Wash. on native oysters; also in several localities in Alaska from mussels.None

(con.)

of them are over ½ inch in length. It also has distinctive markings, and should be considered either a species or a subspecies of A, pelta which is much larger and has a different habitat. The many lots of Acmaea nacelloides in my collection are quite distinct from A. pelta and certainly rate at least a subspecific name. Acmaea (cassis)Vpelta monticola Carpenter . I have this subspecies from Del Rey, California collected by Stanley Field. It is commensal on mussels and is perhaps the counterpart of the northern A. pelta olympica but is higher in elevation and with a different color pattern. Seems to be a good species.

Miss Bristol of the San Diego Museum of Natural History reports many localities in Alaska and ondown to San Diego. Also from Nemuro and Abaskiri , Hokkaido, Japan by Dr. F. Baker.

The consensus of opinion among the members is that this is but one very variable species withthe following in synonymy : cassis Esch.1833; fimbriata Gld.,1846; pileolus Midd. 1847; cinis Rve.,1855; nuttalliana Rve. 1855; leucophaea Rve.,1855; textilis Adams,1858; fimbriata Gld.,1862; pintadina Gld.,1862; tesselata Binney,1863; var nacelloides Dall,1871; var hybrida Shepard,1895:73; olympica Dall,1914; monticola Dall,1914.

There are sets labelled hybrida in some southern California collections. It might be of interest to reprint the original description of this variety.- Shepard, I.M., 1895- Nautilus 9 :72-73 " In one natural color phase, the entire external surface is beautifully glossy black (the variant nacelloides,...), while others with normal color patterns are black and white, in various designs and oroportions of the two colors. Still others show the pure black coloration on the lower half of the shell, but have a black and white pattern on the upper half of the shell, Such specimens are often compressed and spread in the lower half of the shell, in which case they have been called hybrida Shepard,1895."

Acmaea asmi Middendorff,1849. Sitka, Alaska to Soccoro Island,Mexico. Type locality, Sitka , Alaska.

Collecting data: The only confusion that I have noticed with this species is that I recently observed some shells identified as this species that are in reality the small black form of A,pelta which is in places very common on sea weed as well as adjoining stones. However, the two are easily separable and about all they have in common is size and both being black. We have taken asmi always on Tegula from Crescent City to Todos Santos Bay. In the northern part of the range the habitat seems to be on Tegula funebralis , but around Todos Santos Bay they are found on Tegula gallina. (Burch); Crescent City (Chace); Cambria (Wilcox); S. of San Quintin Bay (Orcutt); San Diego (Hemphill); Todos Santos Bay (Orcutt); San Nichlas Island (Lowe);

Acmaea instabilis (Gould),1846. Kodiak Island, Alaska south to San Diego Calif. Type locality, Puget Sound.

Collecting data: The southern record of this species may be in doubt. I note that Dr . Keen stops the southern range at Monterey. However, I have collected it at Cayucos, San Luis Obispo Co., and see no reason why it might not be taken fatther siuth rarely. It is particulatly abundant at Crescent City, Calif. (Burch); Farallones Islands (Arnheim); Neah Bay, Wash. (Oldroyd); Crescent City (Chace); San Simeon (Wilcox); Duxbury Reef (Lowe); Pt. Reyes (W.P. Cook) (San Diego Museum); Challam Bay, Clallam Co., Wash. 1925 on kelp holdfasts (Eyerdam).

Acmaea ochracea Dall, 1871. (peramabilis Dall 1879) Alaska to San Miguel Island. (Test). Type locality, Vancouver district.

" Apex in second quarter of shell, erect, forming an obtuse cone. All faces nearly plane. Aperture oviform. Sculpturing of straight, unbranched sharp cut striae (threads) proceeding from apex to border with very little increase in magnitude. Interspaces exceedingly small near apex wider as margin is approached: very flat. Margin entire, sharp. Internal finish highly lustrous, of very thin nacre, with external coloring and sculpturing showing through. Interior characterized by broad pinkish tawny border, pink tinged intermediate area, and chestnut apical area of good size but no special shape. Color of interior yellowish-buff, tinged here and there with rose. The species is sometimes infected with fungus (Bonar, 1936), sometimes coated with a heavy coat of red brown algae, sometimes flecked with spots of coralline algae, but most often in large part free of infecting extraneous growths." Variations: " The pale variant has likewise been considered to intergrade with scutum. This error was caused by the failure on the part of some workers to distinguish light-color phase specimens of limatula which had fine sculpturing from scutum, and who considered such specimens to be intergrades between scutum and ochracea. A study of the radular ribbon alone suffices to disprove this idea, since it shows that scutum and ochracea do not belong to the same subgenus." " ... does not actually extend up into the intertidal belt at all. Individuals are almost never found exposed by the tide, not even located in isolated tidepools, but only where the tide leaves a considerable amount of water which is continually replenished by wave action throughout the intertidal period." The chosen roosting site of individuals of this genus is very characteristic, being upon solitary, rather small rocks which are usually devoid of other kinds of inhabitants." (Test)

The above are extracts from some of Mrs. Test's work and noted by one of the members. It is of great interest because the validity of this species has been in some question. The general idea seems to have been that they were juvenile scutum. Mr. and Mrs. E.P. Chace collected specimens of this species from the deeper tidepools at Pt. Pinos and noted that about $\frac{1}{2}$ of them were light colored. It is difficult to analyze this situation. It is obvious that shells from the deeper tidepools will be of smaller size, less eroded, show their ribs better than perhaps the same species higher up. Apparently no member of the club has reported taking this species south of the Monterey region. While the range is listed as given by Mrs. Test south to San Martin Island, it seems certain that the same shells collected by the Chaces at Pt. Pinos are exceedingly rare in southern California if found her at all.

Another interesting thing about this problem is the placing of peramabilis Dall in the synonymy. That species has been considered distinct. Mrs. Test we are told considers it a synony, but for the sake of the record here the data on that species follows.

Acmaea peramabilis Dall, 1872. Shumagin Islands, Alaska on granite rocks only. South to Prince William Sound (Eyerdam). Type locality, Shumagin Islands.

Collecting data: Drier Bay, Knight Island, Alaska, 1923. " A small rare species - dredged on stones. The five specimens that I collected were identified by Dall. They resemble Lepeta caecoides but are pink. There is no close relationship to scutum in these specimens." (Eyerdam).

Acmaea triangularis Carpenter,1864. Sitka,Alaska to the Gulf of Calif. (Dall). Type locality, Monterey, Calif. We are advised that the Gulf record is seriously questioned. Dr. A. Myra Keen advises " The latitude range for A. triangularis should be 37-39, not 33-39 as I gave it in my Abridged Check List."

Collecting data: Our only experience with this species which seems to be very distinct indeed was in the Monterey Bay dredgings both off Del Monte and off Pacific Grove. Laving specimens collected in some numbers from coralline algae littoral. Mr. E.P. Chace was responsible for first collecting this littoral and showing us where they were in our group.

Acmaea digitalis Eschscholtz,1833. Aleutian Islands to Socorro Island, Mex. Type locality, Sitka, Alaska.

This is one of the most abundant species on the coast and easily collected in any number from points above or near the tide line. The two varieties listed in Bull. 112, umbonata Reeve,1855 and textilis Gould,1846 are in my opinion of no consequence. A. oregona Reeve,1855 and strigillata Binney,1863 are also in the synonymy, we are informed in the opinion of Mrs. Test. It is certain that umbonata and textilis both intergrade and appear in every large lot taken.

Acmaea scabra (Gould),1846. (A. spectrum Auct.) Vancouver Island, B.C south to Cape San Lucas. Type locality, San Francisco, Calif.

This common species with the rough radiating ribs should require no comments. However, there are specimens thatrequire so much study that a genuine problem is involved whether to place it in with A. digitalis of A. acabra. I may be in error but it is my opinion that a number of these species do actually intergrade. The habitat is high, above the tide line.

Acmaea conus Test,1945. Nautilus 58:92,93. Point Conception,Calif. to Cape San Lucas and the Revilla Gidep Islands. Type locality, Point Fermen, San Pedro, Calif.

The original description follows: " Apex near anterior third of shell, erect, highest point of shell. Lateral and anterior faces plane or slightly convex. Sculpturing of roughly rounded ribs, often branched, irregularly spaced,with a suggestion of spines near the apex. Interspaces usually wider at margin than ribs, and often finely corded in irregular fashion. Margin crenate due to slight projection of ribs. Surface of interior highly lustrous , with large brown " owl" filling apical area inside muscle scar; intermediate area white, with pencil lines from exterior often showing through; border irregularly marked with brown; muscle scar not conspicuous. External color pattern of ivory ribs alternating with interspaces tinged throughout with pale verdigris streaked with ramifying pencil lines of brown, the brown lines frequently forming a network, which near the apex often is stelliform. Soft parts of the animal with distinctive coloring, the side of the foot being white speckled with black pinhead dots (unlike that of any other species of Acmaea)on the wesy coast of North America except A. scabra, which is similar." Largest of type specimens 17.5 x 13.7 x 6 mm. high.

" The ribs may be sharply defined, smoothly rounded, and very narrow in comparison with the interspaces. They may be much lighter in color than the interspaces, which are frequently gray or dark. The ribs may be completely unbranched, and frequently have no suggestion of spines. The interior may be blue in the intermediate area, and the border may be dark interupted by white where the ribs are. The central area may be white. The external coloring may be of various patterns in gray between ivory ribs. Occasionally, the ribs also are gray. Sometimes the entire color pattern is obscured by the ravages of fungus infection."

The apparent difference at a glance is that the interior of conus is shiny whereas that os scabra is dull.

Acmaea limatula Carpenter,1864. Puget Sound to Maria Madre Island, Mex. also Gulf of Calif. as far north as Coronados Islands. (Test). Type locality not selected.

This is one of our most abundant species. The only difficulty in separating it is possible confusion with A. scutum in the young. It is necessary to put a glass on the ribs if they are in any way worn at times also. An interesting thing about limatula is the prevalence of albino specimens. Pure white or rather cream colored specimens are common in all colonies along with the odd mixture of those with white blotches on them. Common on stones above tide mark.

The subspecies A. l. morchii Dall,1878 is in my opinion of no consequence. It is possible to select a set to fit the description of this high arched form from any large series of limatula. Of course, there are locations where this high arched form seems to predominate. The San Pedro breakwater is an excellent place to get a lot of limatula that you can label morchii (but be sure to throw out all of the flat ones you take with them.)

Subgenus ? / Panama(Reed)

Acmaea rosacea Carpenter,1864. Ketchikan, Alaska south to Acapulco,Mex. Type locality, San Pedro, Calif.

Collecting data: Our experience has been to find this a moderately deep water species and never taken littoral. It is a very common small species in the dredgings from off Redondo Beach in 25 fms. gravel; Malaga Cove in 15 fms.; off Avalon, Catalina Island in 25 fms.; (Burch); off Coronado Islands, L.C. in 14 fmms.; off Ballast Point, San Diego: Magdalena Bay (Dr. F. Baker); Taboguilla Is., Panama- dredged (Reed); Guaymas in 20 fms. (Lowe); Monterey (Hemphill and Lowe); Imperial Beach (Randall); La Jolla (Bristol). (San Diego Museum). * Note* this species does come in with washed in kelp holdfasts.

Subgenus Rhodopetala Dall,1921. Type (by monotypy), Acmaea rosea Dall.

There is serious question about whether or not this belongs even in the family Acmaeidae. Its exact position is very doubtful. Perhaps we may receive some later information on it.

Acmaea rosea (Dall),1872. Kyska Island, Aleutians to the Shumagin Islands Alaska. Type locality, East side of Simeonoff Island, Shumagins.

The following notes on Acmaea are of interest:

Acmaea atrata Carpenter,1864. According to our data this is a Gulf of California and Lower Californian species. However, Dr. W.O. Grogg has two sets , one from Santa Monica and one from San Pedro that were identified by the late Dr. Dall as being this species. We question this record but it should be carefully investigated.

Acmaea conus Test,1945. Dr. A. Myra Keen calls attention to the following: " Acmaea conus Test,1945 was figured (but fortunately not validated with a description) by S.F. Light in 1941 in his " Laboratory and Field text in Invertebrate Zoology", a lithoprint publication sold at the Univ. of Calif. Associated Students store for $5.00. The figures are: pl. 12, figs. 20,30; pl. 13, fig.3; pl.14, figs. 5-6. They check well with the specimens Allyn Smith had."

Mr. W.J. Eyerdam reports on some of the species as follows:

Acmaea rosea Dall,1872. Izhut Bay, Afignak Island, 1922, rare; Sitkalidak Island, 1931, rare; Port Vita, Raspberry Island, 1945 .

Extended geographical range- Several hundred miles eastward to Kodiak Islands.

The following are species of Acmaea not included in your list that I have in my collection.

Acmaea patina Eschscholtz- Drier Bay, Knight Island, Alaska.

Acmaea spectrum Nuttall- San Pedro, Calif.

Acmaea pelta fimbriata Gould- Shuyak Strait, Afognak Island, Alaska,1924.

Acmaea pelta elevata- Puget Sound

Acmaea atrata Carpenter,1864- Piedras Blancas, Calif.

* Note*- Most of the above species were placed in the synonymy in our report given above..

Dr. W.O. Grogg contributed some comments on Acmaea. Most of the points raised are covered in our discussion above.

" Acmaea cassis Eschscholtz- If page priority means a thing cassis stands and pelta is only a variety, subspecies or perhaps a synonym. Dall quoted the wrong page too but this was corrected by Oldroyd. Dall gives page 11 in Exchscholtz's Atlas but it should be page 19. On page 19 the following species are described in the following order,(4) A. cassis,(5), A. pelta (6) A. scutum, and (7) A. patina. In Nautilus 28:13-15, for no reason at all, Dall makes cassis a form of A. pelta. At least a reason not stated is as good as no reason at all. Do you have access to Carpenter's description of A. monticola? We used to call the form that grows on mussels A. c. monticola. Others call it nacelloides making no distinction from the form which grows on floating kelp. They certainly are distinct enough although obviously only situs forms doubtless also influenced by food supply. I am of the opinion that patina and pintadina should be placed in the synonymy with A. scutum. That Acmaea cassis hybrida thing is purely a situs form which got its start on either kelp or Mytilus and later moved to a rock and the later growth is like that of a normal A. cassis. I have specimens of this form which started on kelp and others which started on Mytilus califomus (obviously) and then finished on rocks where I took them, all labelled Acmaea cassis hybrida Hemphill."

* Note* Most of the above questions were discussed on previous pages.

Genus Lottia Gray,1833. Dr A. Myra Keen advises on this genus as follows: " Lottia was described by Gray in 1833(Phil. Trans. R. Soc., pp. 774,800), but no species was mentioned by name. According to the International Rules, the first species assigned to such a genus becomes type. This would be Lottia gigantea Sowerby,1834 (Gen. Shells, no. 42, fig.1); as Sowerby included one or two other species in Lottia at the same time, perhaps we should consider the type as confirmed by subsequent designation of Dall,1871. Sowerby gave name and figure only, no locality."

" Shell patelliform, depressed, the apex anterior. The typical and only species is among the largest and most active of limpets, the shell attaining three inches in length"

Lottia gigantea Sowerby,1834. Crescent City, Calif. south to Guadalupe and Cerros Islands. Type locality not stated.

Collecting data: A very common species, largest of the group, found at or above high tide mark usually on cliffs and large stones exposed to the full surf of the open sea. I have never seen a specimen in an estuary or protected habitat. It seems to increase in size toward the southern end of the range producing giants in Lower California. We have exceptionally large specimens also from the islands especially San Clemente." (Burch) San Luis Obispo Co. (Lowe); San Nicholas Id. (Hemphill); N.E. Guadalupe I d (Huey); Ascunsion Id. (Huey); No. Coronados (F. Stephens); Turtle Bay ((Burgiss); Santa Barbara (Orcutt) (San Diego Museum);

Lottia gigantea albomaculata Dall,1910. Crescent City to Rosario Bay, Lower Calif. No type locality stated. Dr. Dall in Nautilus 24:96 gave the following which is complete and original description " Another shell which seemed particularly attractive, and which was new to me, was a variety of Lottia gigantea , which may be called albomaculata, offering, instead of the usual brown and grey upper surface, the feature of being spotted with rounded white maculations regularly disposed."

This is another color variety which may be collected from any series of Lottia. Anyone wishing to label some shells albomaculata may visit Mal-aga Cove , the San Pedro brwakwater or almost any rocky locality and this variety will be obvious among the more juvenile and protected specimens. I propose to put it in the synonymy of the typical. (Burch).

Family Cocculinidae

Genus Cocculina Dall,1882. Type (by subsequent designation, Dall,1908) Cocculina rathbuni Dall.

" Shell patelliform, apex posteriorly inclined, with a deciduous spiral nucleus; margin entire. The shell resembles that of the Patellidae, but the animal is more nearly allied to Fissurellidae." (Dall).

In Minutes #18, p.3, Mr. George Willett in discussing this genus commented as follows: " Lepeta is most common in from 10 to 30 fathoms, and Cacculina is known only from considerably deeper water. My specimens of Cocculina are from a depth of 70 fathoms in southeastern Alaska, and the only reason they were not discarded as young Acmaeas at the time of collection was because of my realization that Acmaea did not belong in that depth of water, particularly at such latitude. Two species of this genus are recor ed from the Atlantic Ocean and two more from the Pacific, all from deep water. "

Cocculina agassizii Dall,1908. Off Queen Charlotte Islands, B.C., 145 fms. Gulf of Panama,556 fms. (Dall).

Cocculina cazanica Dall,1919. Kasaan Bay and Stevens Passage,Alaska,95 to 160 fms. Type locality, Kasaan Bay, Alaska.

Family Phasianellidae

Genus Phasianella Lamarck,1804

The following list of species is from Mr. A.M. Strong's notebook.

P. (Tricolia) compta Gould,1855	Mugu Lagoon to San Diego Bay
P. (Tricolia) pulloides Carpenter,1865	Puget Sound to Gulf of Calif.
P. (Tricolia) perforata Philippi,1848	Peru- Nicaragua
P. (Eulitidium) substriata Carpenter,1864	San Pedro to Gulf of Calif.
P. (Eulitidium) rubrilineata Strong,1928	San Pedro to Todos Santos Bay
P. (Eulitidium) typica Dall,1908	Magdalena Bay to Cape San Lucas
P. (Eulitidium) cyclostoma Carpenter,1864	Cape San Lucas
P. (Eulitidium) mazatlanica Strong,1928	Mazatlan and West Mexico
P.(Eulitidium) phasianella C.B. Adams,1852	Panama to Ecuador
P.(Eulitidium) umbilicata d'Orbigny,1840	Bolivia and Peru

In discussion of the family name it is interesting to note that Woodring,1928 uses a family name Tricoliidae to include all American species from both coasts on the statement that Phasianella Lamarck,1804, embraces exotic species more than twn times the size of any of the American species. However, Dr. W.P. Woodring (Per. Comm. Nov. 1945) states " I did not propose the family name Tricoliidae, but I do not remember where I got it. Differences between Phasianella and Tricolia involve more than difference in size. See Pilsbry, Manual Conch., vol. 10, pp. 162-164,1888."

Grant and Gale and others use the genus Tricolia Risso,1826, a practice which I had adopted. However, Mr. A.M. Strong in " West American Mollusca of the Genus Phasianella " , Proc. Calif. Acad. Sci. vol. 17, pp. 187-203, pl. 10, 1928 uses Phasianella with Tricolia as a subgenus. I amdisposed to follow Strong if the principal difference between the two is size. We have giantsand pygmies in other genera.

Genus Phasianella Lamarck,1804. Type (by original designation,Faisan (Buccinum australis Gmelin.) (Fide Woodring, 1928, p. 418.)

Subgenus Tricolia Risso,1826. Type (by subsequent designation, Gray, 1847), Turbo pullus Linnaeus.

" Shell small, ovate, body whorl inflated. Aperture broadly ovate. Outer lip thickened, abruptly angulated and slightly channeled where it meets callus on parietal wall. Umbilical opening reduced to a narrow trough like groove or virtually closed. Operculum calcareous, outer surface inflated, inner surface concave and bearing near its lower inner edge an eccentric spiral nucleus." (Woodring,1928, p. 418.).

Phasianella compta Gould,1855. Crescent City, Calif. (Burch) south to Gulf of Calif. Type locality, San Diego, Calif.

Collecting data: Crescent City, Calif.; Monterey; San Simeon; Cayucos; Mugu, Ventura Co/; Santa Monica, dredged in 10 fms ; San Onofre; Newport Bay ; very abunfant on the eel grass in Mission Bay; also very abundant in the Estero de Todos Santos Bay, L.C.; common in many of the Pleistocene deposits of San Pedro. (Burch); San Diego and San Pedro (Lowe).

Dr. Dall in Bulletin 112 and Mrs. Oldroyd following him list two subspecies of Phasianella compta,.P. compta producta Dall,1908 is placed by Mr. Strong in the synonymy of the typical. P. compta punctulata Carpenter, 1865 is placed by Mr. Strong in the synonymy of P. pulloides Carpenter. We are following Strong in this matter.

Phasianella pulloides Carpenter,1864. Puget Sound to Cape San Lucas and the Gulf of California. Type locality on advise of Dr. Keen is Santa Barbara according to the holotype label.

(con.)

Collecting data: Our experience has been to find this species much larger and finer in comparatively deep water than compta and to find it rather rare in littoral collecting. We have such records as , off Malaga Cove in 15 fms.; off Avalon,Catalina Island in 25 fms.; off Redondo Beach in gravel in 25 fms.; off Punta Banda in Todos Santos Bay; from the back of Haliotis rufescens brought up from about 25 ft. off Morro Bay, Calif.; from Pacific Grove, Calif. in 15 fms.; off Santa Cruz Island in 25 ft.; Of course, it is to be taken littoral all down the coast usually in algae.(Burch); Monterey and Laguna Beach(Lowe); La Jolla (Orcutt and Bristol); San Diego (Hemphill).

Phasianella pulloides elatior Carpenter,1865 , type locality, Santa Barbara Calif. is placed in the synonymy of the typical by Mr. Strong.

Subgenus Eulithidium Pilsbry,1898. Type (by subsequent designation for Eucosmia, Pilsbry,1888), Eucosmia variegata Carpenter, (not P. variegata Lamarck) plus Tricolia substriata (Carpenter), variety typica. (Fide Grant and Gale), p. 814). However, Woodring, 1928, " Mio. Moll. Jam." p. 420 simplified this by stating Type (herewith designated)- Eucosmia variegata Carpenter. Therefore I assume that the proper statement should be (by subsequent designation, Woodring,1928).

Phasianella rubrilineata Strong,1928. Proc. Calif. Acad. Sci. 4th Ser. vol. 17, no. 6, p. 197, pl. 10, figs. 8,9,10, 1928. Type locality, Point Loma, San Diego Co. Range: Monterey to Todos Santos Bay. to San Martin Id.

According to Mr. Strong, California species that have been identified as typica are this species and the range of typica is southern from Magdalena Bay to Cape San Lucas. Phasianella typica (Dall),1906.

The extension of the range northward to Monterey is based upon a verbal statement made to me some time ago by Mr. Allyn G. Smith to the effect that they had taken this species from shore to 15 fathoms off Monterey. I tried to recognize it in our material and failed to do so.

The original description follows: " Shell minute, depressed turbinate, smooth, except for microscopic lines of growth ; whorls four, apex flattened, the succeeding whorls rapidly enlarging and well rounded; body whorl somewhat oblique; first two whorls whitish, third whorl clouded with white and brown or rose, often showing a few more or less distinct spiral lines of color, b body whorl with alternating oblique spiral lines of rose and white which grow narrower and closer spaced from the suture to the base, upper portion of the whorl often with large white blotches; aperture large,nearly circular, outer lip thin, somewhat flaring, the inner lip surface showing the color lines very distinctly; inner lip slightly flattened, umbilical groove broad, longitudinally striated. Operculum calcareous, outer surface convex, white, darkening toward the outer edge, which is microscopically subspirally striated. Height 2.1, diameter 1.9 mm."

Holotype: No. 2741, Mus. Calif. Acad. Sci. collected by A.M. Strong from Point Loma, San Diego Co., California, paratype; No. 2742, from Todos Santos Bay, Lower Calif., Henry Hemphill collection; paratype: no. 2743, from Point Fermin, San Pedro, Calif.

Specimens of this species were found in all the collections examined. Three specimens, No. 3310 in the Hemphill collection at the Academy, from Todos Santos Bay, Lower Calif. were marked " Phasianella rubrilineata Cpr. Types." As all three were dead shells a living specimen is picked for the type but the name, which does not seem to have been polished is retained.

(con.)

In the older collections the specimens of this species are usually labeled P. cyclostoma Carpenter, but they have more recently been identified as P. typica Dall. They differ from those species in the Cape San Lucas material in being smaller, more depressed, with a proportionately larger sperture and a distinctly different color pattern. They are easily distinguished from the young of P. pulloides Carpenter of the same size by the more prominent umbilicus, larger aperture and different color pattern.

Living specimens have been collected along the southern California coast from the smaller sea weeds in the tide pools, and dead shells are quite plentiful in the dredgings outside the kelp line. Additional lovalities from which specimens have been examined are Catalina Island, San Clemente I Island, Point Vicente and Point Fermin in southern California and South Coronado Island and San Martin Islands in Lower Calif.

Phasianella substriata (Carpenter),1864. Monterey, Calif. to Panama. Type locality, Cape San Lucas.

Collecting data: Our experience has been to find this an exclusively dredged shell from moderate depths. It is comparatively common off Redondo Beach in 25 fms. gravel and elsewhere, around Todos Santos Bay. It is not uncommon in the Pleistocene of Timm's Point, San Pedro (Burch); off South Coronado Island in 10 fms. (Dr. F. Baker); San Pedro in 10 fms. (Lowe).

Phasianella lurida Dall,1897. Vancouver Island to Mendocino Co., Calif. (Dall). Type locality, Skidegate Channel, Queen Charlotte Islands in 20 fms.

Collecting data: Crescent City, Calif. (W.P. Chace).

Family Turbinidae

Genus Astraea Roeding,1798. Type (by subsequent designation) Suter,1 1913), Trochus imperialis Gmelin) - Trochus heliotropium Martyn) ; Recent New Zealand.

Subgenus Pomaulax Gray,1850. Type, Trochus undosus Wood.
" Shell large, conic, solid, imperforate; periphery carinated; base flattened; umbilical tract with a strong, curved rib; operculum obovate, narrower toward the proximal extremity, nucleus terminal, outside with four strong granulose ribs radiating from the nucleus." (Pilsbry).

Grant and Gale state of this " This subgenus is readily distinguished from Astraea s.s. by its imperforate axis, whereas the typical subgenus is widely umbilicate. Pachypoma Gray differed in its long and very convex operculum and the absent or very obscure semicircular rib in the umbilical region." * Note* " The earliest type designation for Pomaulax was of Cossmann,1918: Trochus japonicus Dunker. " (Dr. A.M. Keen).

Astraea undosa (Wood),1828. Mugu Lagoon, Ventura Co. to Cerros Island, L.C. Type locality, California.

Collecting data: An interesting thing in our experience with this species has been that we have found it a shallow water species in Santa Monica Bay with the A. inaequalis in deeper water. Perhaps the largest individual specimen we ever collected came from about 10 fathoms off Avalon, Catalina Island. The most abundant locality for the species in our experience was Punta Banda, L.C. on the far side of Todos Santos Bay in October,1936. They were literally so thick it was difficult to stop and not hit one. We have found them in the estuaries as well as the open sea. They seem to be seasonal in coming in in great numbers although our records show that we have collected them in almost every month of the year. (Burch)

(continued bottom of Page 21)

Family Turbinidae
The following keys and notes are from Mr. A.M. Strong's notebook.

Base flattened or concave .... Astraea
. Operculum oval
.. Outside of operculum with 3 spiral ribs ....(Pomaulax)
... Periphery with an undulated spiral rib
Diam. 110 mm Mugu Bay to Cerros Island .... undosa
... Periphery with 2 rows of nodules
Diam. 41 mm. Magdalena Bay ....turbanica
.. Outside of operculum with 2 spiral ribs ....(Uvanilla)
... Periphery with about 16 rounded projections
Gulf of Calif. to Panama .... unguis
... Periphery winged and armed with vaulted projections
.... Umbilical region white
Gulf of Calif. to Peru .... buschii
.... Umbilical region orange-red
Gulf of Calif. to Panama .... olivacea
Operculum oblong, very convex ....(Pachypoma)
.. Spire with 3 spiral grooves cutting the axial ribs
... Axial ribs on body whorl about 70
Diam. 60 mm. British Columbia to San Diego ...... inaequalis
... Axial ribs on body whorl about 30
Diam. 37 mm. Santa Cruz Island .... barbarensis
... Axial ribs on body whorl about 20
Diam. 31 mm. Gulf of Calif. .... spirata
.. Spire with 4 spiral grooves cutting the axial ribs
Diam. 38 mm. Magdalena Bay .... magdalena
.. Spire with alternating beaded spiral cords
Diam. 36.5 mm. Cerros Island .... lithophora
Base rounded, convex
. Shell large, outer surface of operculum convex .... Turbo
.. Outer surface of operculum smooth ....(Turbo)
... Sculptured with spiral rows of elevated scales
Diam. 25 mm. Gulf of Calif. to Peru .... squamiger
... Sculpture fine or obsolete
.... Columella with a longitudinal rib
Diam. 30 mm. Peru to Magellan Strait .... niger
.... Columella simple
..... Shell large, delicately axially striate
Diam. 170 mm. Ecuador to Peru .... magnificus
..... Shell small, obsoletely spirally striate
Diam. 12 mm. Chile .... elevatus
. Shell large, outer surface of operculum convex
.. Outer surface of operculum spirally grooved .... (Callipoma)
... Surface sculptured with nodose spiral ribs
Diam. 65 mm. Gulf of Calif. to Peru .... fluctuosa
... Surface roughened by axial and spiral laminae- subsutural tubercles
Diam. 50 mm. Gulf of Calif. to Peru .... saxosa
. Shell small, operculum concave with a raided margin ...Homalopoma
.. Sculptured with fine spiral striae
Diam. 5 mm. Puget Sound to San Martin Island .... bacula
.. Sculptured with distinct spiral threads
... Body whorl with about 15 subequal spirals
.... Interspaces equally the threads in width
Diam. 9 mm. Alaska to Cape San Lucas .... carpenteri
(con.).

.... Interspaces narrower than the threads
Puget Sound to Cape San Lucas .... lurida
... Body whorl with about 12 wide spaced spirals
Diam. 9 mm. San Diego to Tia Juana .... juanensis
... Body whorl with about 8 strong spirals
Diam. 5 mm. Monterey to Coronado Islands ...... paucicostata
... Body whorl with 5 major and many minor spirals
Diam. 6 mm. San Diego .... grippi
... Body whorl with 3 major and many minor spirals
Diam. 11 mm. Bay of Panama .... panamensis

Genus Turbo Linnaeus,1758
Turbo (Senectus) squamiger Reeve,1842 Gulf of Calif. to Peru
Turbo (Callopoma) fluctuosus Wood,1828 Gulf of Calif. to Peru
Turbo (Callopoma) magnificus Jonas,1847 Ecuador to Peru
Turbo (Callopoma) mazatlanicus Pilsbry & Lowe,1932 Gulf of Calif.
Turbo (Callopoma) niger Wood,1828 Perú and Chile
Turbo (Callopoma) saxosus Wood,1828 Gulf of Calif. to Perú
Genus Astraea Roeding,1798
Astraea (Pomaulax) turbinicus Dall,1910 Magdalena Bay
Astraea (Pomaulax) undosus Wood,1828 Mugu Lagoon to Cerros Island
Astraea (Pachypoma) barbarensis Dall,1919 Santa Cruz Island
Astraea (Pachypoma) inaequalis Martyn,1784 Vancouver to San Diego
Astraea (Pachypoma) magdalensis Dall,1910 Magdalena Bay
Astraea (Pachypoma) spirata Dall,1919 Gulf of Calif.
Astraea (Uvanilla) babelis Fischer,1874 Ecuador
Astraea (Uvanilla) brevispinus Lamarck,1822 Atlantic ? Panama
Astraea (Uvanilla) bushii Philippi,1844 Gulf of Calif. to Peru
Astraea (Uvanilla) olivaceus Wood,1828 Gulf of Calif. to Ecuador
Astraea (Uvanilla) unguis Wood,1828. Gulf of Calif. to Panama
Genus Homolapoma Carpenter,1864
Homolapoma bacula Carpenter,1864 Puget Sound to San Martin Island
Homolapoma carpenteri Pilsbry,1888 Sitka to San Martin Island
Homolapoma conceptionis Lowe Gulf of Calif.
Homolapoma cunninghami Smith,1881 Chile
Homolapoma grippi Dall,1911 San Diego
Homolapoma juanensis Dall,1919 San Diego to Tia Juana
Homolapoma lurida Dall,1885 Puget Sound to Cape San Lucas
Homolapoma panamensis Dall,1908 Panama
Homolapoma paucicostata Dall,1871 Monterey to San Martin Island

Continued from page 19-

Subgenus Pachypoma Gray,1850. Type (by subsequent designation,Pilsbry 1888), Trochus inaequalis Martyn.

" Shell similar to Pomaulax, but umbilical area scarcely ribbed and operculum small, externally very convex, white and smooth, with a broad central convexity and obscure, narrow side ribs."

Astraea gibberosa Dillwyn,1817. (Astraea inaequalis (Martyn)
Vancouver Island, B.C. to San Diego, Calif.

The substitution of the above name for our familiar inaequalis Martyn has been adopted after considerable discussion and by no means agreement. Dr. Joshua L. Baily Jr. is in favor of retaining the Martyn names as long as possible. However, if they must be abandoned the sooner we start getting the next available names the better off we will be. Dr. A. Myra Keen writes

(con.)

on this matter (Per. Comm. Nov. 1945) " If we are to abandon Martyn's names and I am convinced Martyn is, as Winckworth says, both non-binomial and non-binominal, we must find a substitute for Astraea inaequalis. The first available substitute seems to be A. gibberosa Dillwyn,1817 (Desc. Cat. Recent Shells, vol. 2, p. 803). Based on Trochus gibberosus Chemn. vol. 10, p. 287; Martyn Univ. Conch. pl. 31; Favanne, vol. 2, p. 13. Type loc.: Zew Zealand and Friendly Islands (the latter is Martyn's locality, obviously wrong). Dillwyn's description: " Shell conical, with oblique plaits on the upper part, a trahsverse row of tubercles below, and the margin of the whorls spinous. Shell about an inch and 3/4 long, and two inches broad, of an olive or greenish or reddish brown colour.."

Collecting data: We have found this species comparatively common from Monterey south to off Redondo Beach, Calif. in about 35 fathoms. We dredged any number of them off Monterey in all depths from very shallow down to approximately 40 fathoms. Among the various lots we have collected including those from off Redondo Beach it is my opinion that it would be possible to select all of the specimens you wished to fit the descriptions of the subspecies pacifica Dall,1919 which I propose to place in the synonymy of the typical following Grant and Gale and others. The subspecies montereyensis Oldroyd 1927 (Stanford Univ. Publ. Geol. Sci. vol. 2, pt.3, p165,166. Type locality Monterey. I have taken perhaps several hundred specimens of this species from Monterey Bay and have never been able to detect the slightest difference between any of them and a similar lot from anywhere else. It is my opinion that montereyensis is also properly placed in the synonymy.

Astraea barbarensis Dall,1919. Off Santa Cruz Island, Calif. in 30 fms.

Genus Homalopoma Carpenter,1864. (Leptothyra Dall) Type (by monotypy), Turbo sanguineus Linnaeus.

" Shell small or minute, globose, depressed, solid, compact; umbilicate or imperforate; whorls 3-7 spirally sculptured, the last generally somewhat deflexed at the aperture; aperture subcircular, white and nacreous within; columella generally but not always bluntly denticulate near the base. Operculum subcircular, nearly flat or concavo-convex, inside with a very thin corneous layer, slightly convex, with many gradually increasing whorls, the nucleus subcentral; outside calcareous, subspiral, with a slightly convex concentric elevation or ridge around the margin, most prominent at its termination, the middle portion concave and more or less rugose." (Pilsbry)

Homalopoma carpenteri (Pilsbry),1888. Sitka Sound, Alaska to San Martin Island, L.C. Type locality, California.

Collecting data: In our experience one of the commonest of small littoral shells from Monterey to Mexico. We have also brought it up in the dredges from some rather surprising depths. It is common as deep as 25 fathoms off Redondo Beach with some as deep as 50 fathoms, always from rock or gravel bottom. Dredged off Catalina Island in 35 fathoms. (Burch); Forrester Island (Willett); Monterey (Hemphill and Lowe); Cayucos (Wilcox); San Pedro and Laguna Beach (Lowe); La Jolla (Bristol); Redondo (Kate Stephens) (San Diego Museum).

Homalopoma luridum (Dall),1885. Puget Sound to Cape San Lucas. Type locality, on advice of Dr. A.M. Keen " San Diego, according to holotype label in the U.S.N.M.".

Collecting data: Puget Sound (W.J. Eyerdam); San Juan Island,P.S. (Lowe); La Jolla (Beckwith); Imperial Beach (Kate Stephens) (San Diego Museum).

Homalopoma baculum (Carpenter),1864. Puget Sound to San Martin Island. Type locality, Catalina Island, Calif.

Collecting data: Our experience has been to find this smooth species with carpenteri in southern California and Todos Santos Bay littoral/ We did not recognize it from Monterey Bay. Our records read Malaga Cove southward. (Burch); Monterey (Hemphill); San Pedro (Lowe); San Martin Island (Dr. F. Baker); So. Coronado Island (Kelsey) (San Diego Museum).

Homalopoma paucicostatum (Dall),1871. Monterey south to San Martin Island (Baker) and to Guadalupe (Strong and Hanna). Type locality, Monterey.

Collecting data: Dredged off Monterey, Calif. in 10-15 fathoms; off Redondo Beach in 50 fathoms north side of the canyon. Our experience has been to find this a deepwater species never having recognized it in littoral collecting. (Burch); San Pedro (Hemphill); La Jolla (Chancy,Wilson and Bristol); Pt. Loma (Dr. F. Baker); So. Coronado Island in 16 fms. (Baker) .

Homalopoma paucicostatum fenestratum (Bartsch),1919. Monterey to Coronado Islands. Type locality on advice of Dr. A.M. Keen " Monterey on holotype label."

Grant and Gale state " Typical paucicostatum (Dall) is readily distinguished by its few, prominent, spiral ribs. However, a series of specimens obtained by Mr. George Willett from off Catalina Island seems to include specimens intermediate between paucicostatum and carpenteri, and it is possible that the difference between these two shells is varietal rather than specific."

Homalopoma juanensis (Dall),1919. San Diego, Calif. to Tia Juana, L.C. Type locality, Tia Juana, L.C.

Homalopoma grippi (Dall),1911. San Diego, Calif. in 100 fathoms, to Catalina Island in 50 fathoms.

Collecting data: Catalina Island in 50 fms. (Lowe).

Homalopoma engbergi (Willett),1929. Type locality, Olga, Wash.and known only from the type locality. Nautilus 43:27,28, pl.3, fig.4,1929. Original description follows: " Shell small, globose, solid, either perforate or imperforate; whorls convex, marked by thread-like spiral riblets which are rendered minutely nodulous by the intersection of the growth lines. On the last whorl there are about thirty of these riblets. Aperture about half the height of the shell, almost circular, white to bluish white within. Outer lip rather thin; inner lip thickened. Columella arcuate, flattened, without tooth. Color of shell dark brown to dull black in unworn specimens. Operculum of several whorls, shelly, concave, with nucleus a little anterior to the center and considerably nearer to the columella than to the outer lip. Alt. 3.3 mm. diam. 3.2 mm.. Type No. 1017 Collection Los Angeles Museum. Paratypes in collections of Dr. Engberg and the writer. The type and many additional specimens were collected by Dr. Carl C. Engberg at Olga, Wash. This well marked little shell is perhaps nearer to L. bacula Cpr. than to any other known species of west American Leptothyra. It differs markedly from t that species however, in much smaller size, difference in coloration, lack of columellar tooth, and in the fact that it is often perforate. Of 28 specimens sent in by Dr. Engberg, 20 are perforate in greater or less degree, and the remaining imperforate."

Family Liotidae

The following keys and lists are from Mr. A.M. Strong's notebook.

Surface latticed with equal axial ribs and spiral cords .... Liotia
Surface not latticed
. Periphery with smooth or nodulous spiral cords or keels ...... Arene

Genus Liotia

Shell 4 mm. or more in diameter
. Shell turbinate, with the spire elevated
Diam. 8 mm. Peru and Chile .... cancellata Gray
. Shell depressed, with flattened spire
Diam. 4 mm. Monterey to Gulf of Calif. .... fenestrata Carpenter
Shell 1 mm. in diameter or less
Diam. 0.6 mm. Mazatlan.......................c-b-adamsi Carpenter

Genus Arene

Entire surface roughened by axial lines
. Spiral sculpture of 2 or 3 major spiral cords
.. Finer spiral striae present
... Fine spiral striae present over entire surface
Diam. 4.7 mm. Magdalena Bay to Tres Marias Islands ... rammata Dall
... Spiral striae absent between keels
Diam. 3.6 mm. Panama .... balboai S. & H.
.. Finer spiral striae absent
... Spiral keels on body whorl 2
Diam. 2 mm. Galapagos Islands ....scitula Dall
... Spiral keels on body whorl 3
Diam. 1 mm. Mazatlan .... striulata Carpenter
. Spiral sculpture of numerous, more or less nodulous cords
.. Whorls strongly shouldered
... Base with 3 nodulous spiral cords
Diam. 6 mm. Socorro Island .... socorroensis Strong
... Base with 4 nodulous spiral cords
Diam. 5.5 mm. Gulf of California .... carinata Carpenter
.. Whorls not strongly shouldered
... Base with 7 spiral cords
.... Cords on periphery undulated, not beaded
Diam. 6.2 mm. Panama .... olivacea Dall
.... All spiral cords beaded Panama ....var. litharia Dall
... Base with 5 tuberculate spiral cords
.... Spire moderately elevated
Diam. 8 mm. Nicaragua .... winslowae Pilsbry & L.
.... Spire depressed
Diam. 7.7. mm. Manzanillo,Mexico ....hidsiana Pils. & Lowe
Axial sculpture absent or confined to interspaces between spiral keels
. Spiral sculpture on body whorl of 6 to 9 keels
.. Spiral sculpture on body whorl of 6 keels
... Interspaces between keels smooth.
Diam. 3 mm. Monterey to Tres Marias Islands ....acuticostata Carp.
... Interspaces between keels with axial threads
Diam. 3 mm. Monterey to Gulf of Calif. ......var. bristolae Baker
.. Spiral sculpture on body whorl of 9 keels
Diam. 2 mm. Panama .... heimi S. & H.
. Spiral sculpture on body of 20 or more cords
.. Axial sculpture present
Diam. 2 mm. Panama .... erici S. & H.

(con.)

•• Axial sculpture absent
Diam. 1.6 mm. Cape San Lucas .... lucasensis Strong

Peripheral nodes 6, blunt, rounded
Diam. 23 mm. Lower California .... californica Dall
Peripheral nodes 8, flattened, spinose
Diam. 15 mm. Gulf of California .... pacis Dall

Family Liotidae

Shells small, turbonate, with a thickened, continuous outer lip and open umbilicus. The operculum is corneous, multispiral, with an outer layer of calcareous pearly grains" (Strong).

Genus Liotia Gray,1847 Type (by original designation) Delphinula cancellata Gray.

" The shells placed in Liotis s.s. have the surface deeply pitted between strong axial ribs and spiral cords." (Strong).

Liotia fenestrata Carpenter,1864	Monterey to San Martin Island
Liotia c-s-adamsi Carpenter,1857	Mazatlan
Liotia cancellata Gray,1826	Peru and Chile

Genus Arene H. & A. Adams,1854. Type (by subsequent designation), Turbo cruentata Megerle von Muhlfield.

" In Arene the spiral sculpture is distinct while the axial sculpture is absent or reduced to fine lines, in some species giving the surface a scaly effect." (Strong).

Arene acuticostata Carpenter,1864.	Monterey to Gulf of California
var. bristolae Baker,1929	San Pedro to Gulf of Calif.
var. stearnsii Dall,1918	Gulf of Calif.
var. supranodosa Strong,1933	Gulf of Calif.
Arene rammata Dall,1918	Cape San Lucas
Arene lucasensis Strong,1933	Cape San Lucas
Arene carinata Carpenter,1857	Gulf of Calif.
Arene striulata Carpenter,1857	Mazatlan
Arene hindsiana Pilsbry & Lowe,1932	Manzanillo
Arene winslowae Pilsbry & Lowe,1932	Nicaragua
Arene olivacea Dall,1918	Panama
var. litharia Dall,1918	Panama
Arene socorroensis Strong,1933	Socorro Island
Arene scitula Dall,1919	Galapagos Islands
Arene erica Strong & Hertlein	Panama
Arene balboae Strong and Hertlein	Taboga Island, Panama
Arene heimi Strong and Hertlein	Taboga Island, Panama

Liotia (?) californica Dall,1908	Cerros Island
Liotia (?) pacis Dall,1908	Gulf of Calif.

Family Liotidae

" Shells small, turbonate, with a thickened, continuous outer lip and open umbilicus. The operculum is corneous, multispiral, with an outer layer of calcareous pearly grains." (Strong).

Two rather important references on this grpup follow:
Strong, A.M. " West American Species of the Genus Liotia", Trans. San Diego Society Nat. Hist., vol.7, no. 37, pp. 429-452, pls. 28-31, May 31,1934.
Pilsbry, H.A. " Notes on the Gastropod Genus Liotia and its Allies", Proc. Acad. Nat. Sci. of Phila., vol. 85, pp. 375-381, pl. 13, March 3,1934

It is interesting to note that Thiele put Homalopoma (Leptothyra in his use) in the subfamily Liotinae of the family Turbinidae.

Genus Liotia Gray,1847 Data given above.
Liotia fenestrata Carpenter,1864. Monterey, Calif. to San Martin Island, (L. cookeana Dall,1918 in synonymy). Type locality on advice of Dr. Keen " Santa Barbara Island on holotype label).

Collecting data: Dredged off Redondo Beach in 25 fms. gravel- rather common; off Avalon, Catalina Island in 25 fms.; off Malaga Cove in 10 fms. (Burch);

Genus Arene H. & A. Adams,1854. Type (by subsequent designation, Woodring,1928), Turbo cruentatus Megerle von Muhlfeld.

" Shell small or medium sized, spire moderately low, Turreted, umbilicus narrow. Aperture circular, oblique. Peristome thick, continuous, attached to parietal wall for only a short distance. Sculpture consisting of spiral threads bearing scales." (Woodring,1928, Carnegie Inst. Wash., p. 422).

Arene acuticostata (Carpenter),1864. Monterey, Calif. to Tres Marias Islands Type locality,Catalina Island, Calif.

Collecting data: Dredged off Redondo Beach in 25 fms. gravel; off Avalon,Catalina Island in 25 fms.; Dana Point, Orange Co.; La Jolla; Punta Banda, L.C. (Burch); No. Coronado Island (Frank Stephens); La Jolla (Chaney Sweet, Bristol); Catalina Island (Hemphill) San Pedro (Lowe) (San Diego M.)

Arene acuticostata bristolae (Baker),1929. Nautilus 43:72,1929 (new name for L. a. radiata Dall). San Diego to La Paz and Gulf of Calif. Type locality, off South Coronado Island.

Collecting data: La Jolla (Chaney,Sweet, Orcutt); San Pedro and Monterey (Lowe) (San Diego Museum).

Genus Molleria Jeffreys,1865. Type (by monotypy), Molleria costulata (Moller). " Shell remarkably solid, with strong and partly dichotomus transverse ribs; peristome continuous. Operculum calcareous, multispiral. (Tryon and Pilsbry, Man. of Conch.).

Molleria drusiana Dall,1919. Amchitka Island to Glacier Bay, Alaska. Type locality, Constantine Harbor, Amchitka Island, Aleutians.

Collecting data: Shuyak Strait, Afognak Island, Alaska, 1924: Raspberry Strait, Raspberry Island, Alaska,1945- under stones at low tide. (Euyerdam).

Molleria quadrae Dall,1897. Amchitka Island, Aleutians to Queen Charlotte Islands, B.C. Type locality, Queen Charlotte Islands, B.C.

Collecting data: Izhut Bay , Afognak Island, 1922; Raspberry Strait, Raspberry Island 1945 under stones. (W.J. Eyerdam).

Family Trochidae

The following keysand lists are from Mr. A.M. Strong's notebook.

Columella ending in a green callus surrounding the umbilicus..Norrisia
Columella twisted
• Columella with two folds .... Turcisa
• Columella with from 1 to 3 denticles .... Tegula
Columella simple, not twisted
• Columella excavated and flattened ....Monodonta
• Columella not excavated
•• Umbilicus closed or reduced to a chink
••• Shell conical, base flattened .... Calliostoma
••• Shell turbinate or globosely conical .... Turcicula
••• Shell cylindrical in the adult ....Halistylus
•• Umbilicus wide and open
••• Inner lip raised or reflected
•••• Umbilicus marginated, funnel shaped .... Solariella
•••• Umbilicus not marginated ....Cidarina
••• Inner lip indistinct
•••• Columella ending in a slight swelling .... Gibbula
•••• Columella curving evenly into the basal lip ....Margarites
•• Base with a false umbilicus ....Clanculus

Genus Norrisia
Shell orbicular, thick, nearly smooth, chestnut brown
Diam. 40 mm. California to Cerros Island .... norrisii
Genus Turcica
Shell conical, blackish, with tuberculate spiral ribs
Diam. 16 mm. Redondo to Cape San Lucas .... caffea
Genus Tegula
Umbilicus closed
• Base flattened or concave
•• Surface sculptured
••• Strong axial plications present
Diam. 35 mm. Catalina to Magdalena Bay.................. regina Stearns
••• Granular spiral cords present
Diam. 40 mm. Gulf of Calif. to Panama ...... pelliserpentis Wood
•• Surface smooth except for lines of growth
••• Shell uniformly yellowish brown
Diam. 35 mm. Mendocino Co. to Monterey .... brunnea Philippi
••• Shell uniformly lusterless black
•••• Shell large, 40 mm. or more in diameter
Peru and Chile .... atar Lesson
•••• Shell small, not over 25 mm. in diam.
Peru and Chile ....moesta Jonas
• Base rounded, convex
•• Sculpture present, fine
••• A narrow puckered band below the sutures
Diam. 35 mm. Vancouver to Cerros Island .... funebrale A. Adams
••• Subsutural band present
Diam. 35 mm. San Francisco to Gulf of Calif. .... gallina Forbes
•• Sculpture absent Chile ....gaudichaudii Hupe
Umbilicus open
• Axial sculpture present
•• Periphery strongly angulated
Diam. 40 mm. Bolinas Bay to Santa Barbara ....montereyi Kiener

(con.).

.. Periphery not strongly angulated
... A spiral row of tubercles below the sutures
Diam. 25 mm. Chile ....melaleuca Jonas
... Sculpture not tuberculate
.... All whorls spirally sculptured
Diam. 21 mm. Gulf of Calif. .... rufotincta Carpenter
.... All whorls not spirally sculptured
..... Spiral sculpture obsolete on lower whorls
Diam. 35 mm. Santa Barbara to Magdalena Bay .....aureotincta Forbes
..... Spiral sculpture confined to the base
Diam. 27 mm. San Diego to Acapulco .... rugosa A. Adams
Umbilicus open
. Axial sculpture absent
.. Distinct spiral keels present
... Periphery with a single spiral keel
.... Spiral keels nodulous
..... Spiral keels four
Diam. 25 mm. Peru and Chile .... quadricostata Wood
..... Spiral keels 1 or two on spire, 5 on base .... mariana Dall
Diam. 12 mm. Santa Barbara to Peru
.... Spiral keels not nodulous
Diam. 40 mm. Peru and Chile ....luctuosa d'Orbigny
...Periphery with 2 spiral keels
Diam. 20 mm. Gulf of Calif. to Chile ....rubroflammulata Koch
.. Spiral keels absent
... Spiral sculpture of numerous cords
.... Cords distinctly granular
..... Columella with a basal and median dentical
...... Columella and umbilicus white
Diam. 20 mm. Monterey to Acapulco .... ligulata Menke
...... Columella and edge of umbilicus green
Diam. 20 mm. San Pedro to Panama ....reticulata Wood
..... Columella with a basal dentical only
...... Last whorl carinated at the periphery
Diam. 8 mm. Gulf of Calif. ....globula Carpenter
...... Last whorl rounded at the periphery
Diam. 15 mm. Peru and Chile ....patagonica d'Orbigny
.... Cords not distinctly granular
..... Cords distinct over entire surface
...... Columella with a median dentical
Diam. 20 mm. Panama to Peru .... panamensis Philippi
...... Columella without a median dentical
.... Spiral cords equal
Diam. 15 mm. San Diego to Tres Marias Islands.... impressa Jonas
.... Spiral cords unequal
Diam. 15 mm. Galapagos .... snodgrassi P. & V.
..... Cords distinct on base only
Diam. 25 mm. Peru .... smithii T. & G.
... Spiral sculpture of fine striae or absent
.... Fine spiral striae present
..... Periphery strongly angulated
Diam. 30 mm. Sitka to Santa Barbara .... pulligo Martyn
..... Periphery rounded, not angulated
...... Spiral striae numerous
Diam. 15 mm. Peru and Chile ....fuscescens Philippi

(con.)

•••••• Spiral striae few, delicate
Diam. 8 mm. Galapagos .... cooksoni E.A. Smith

Umbilicus open, continued
• Axial sculpture absent
•• Spiral keels absent
••• Spiral sculpture of fine striae or absent
•••• All sculpture absent
••••• Umbilicus wide, funnel shaped
Diam. 45 mm. Peruand Chile ....euryomphala Jonas
••••• Umbilicus small, circular
Diam. 20 mm. Peru and Chile ....tridentata P. & M.

The following are not placed; T. coronulata C.B. Adams, C. lugubris and T. californica A. Adams.

Genus Monodonta
Lip black marginated
Diam. 25 mm. Peru and Chile .... crusoeana
Lip not black marginated
Diam. 25 mm. Peru and Chile ....nigerrima

Genus Turcicula
Spire with 3 spiral series of nodes
Diam. 42 mm. Bering Sea to San Clemente Island ..... bairdii Dall
Spire with a single spiral series of nodes
Diam. 60 mm. Panama .... macdonaldi Dall

Genus Halistylus
Surface with close spiral striae
Length 9 mm. British Columbia to Panama ....subpoideus Tryon

Genus Gibbula
Sculpture of about 6 smooth spiral cords
Diam. 4 mm. Monterey to San Diego .... canfieldi Dall

Genus Calliostoma
Umbilicus more or less open
• Shell depressed, apex rounded
Diam. 16.6 mm. Gulf of Calif. ....rema Baker,Hanna &Strong
Umbilicus always closed
• Periphery angulated
•• Sides of whorls flattened or slightly concave
••• Body whorl with 5 or 6 major spiral cords
Sitka to San Diego .... canaliculatum Martyn
••• Body whorl with numerous fine spirals
•••• Basal cords about 12
Diam. 20 mm. Panama ....iridium Dall
•••• Basal cords about 20
Diam. 22 mm. Panama ....nepheloide Dall
•• Sides of whorls flattened or concave
••• Sides of whorls angulated near the middle
•••• Body whorl with 3 to 5 spiral cords
••••• Spiral cords nearly equal
Diam. 10 mm. Peru and Chile ....fonki Philippi
••••• Spiral cords distinctly unequal
Diam. 6 mm. Monterey to San Diego .... splendens Carpenter
•••• Body whorl with 15 or more spiral cords
••••• Spiral cords smooth
Diam. 22 mm. Gulf of Calif. ....bonita,baker,Hanna and Strong

(con.)

..... Spiral cords granular
Diam. 15 mm. Gulf of California ....palmeri Dall
... Sides of whorls rounded
.... Spiral cords equal in strength
..... Spiral cords fine and numerous
Diam. 22 mm. San Francisco to San Diego .....gloriosum Dall
..... Spiral cords few but strong
...... Body whorl with 5 spiral cords
Diam. 12.5 mm. Point Conception to San Diego... turbinum Dall
...... Body whorl with 7 to 9 spiral cords
Diam. Forrester Island to San Diego........annulatum Martyn
.... Spiral cords unequal in strength
..... Spiral cords in two sized
...... Body whorl with 2 or 3 major spiral cords
.... Entire surface tuberculate
Diam. 8 mm. Gulf of Calif. .... macandrae Carpenter
.... Entire surface granular
Diam. 8 mm. Panama ....leanus Carpenter
...... Body whorl with 4 or 5 major spiral cords
Diam. 7.5 mm. San Pedro to San Diego .....supragranosum Carpenter
..... Spiral cords in 3 sizes
Diam. 25 mm. Gulf of Calif. to Panama .....lima Philippi
. Periphery rounded or flattened
.. Sides of whorls flattened or slightly concave
... Body whorl with 3 to 5 major spiral cords
Diam. 25 mm. Puget Sound to Cerros Island ....variegatum Carpenter
... Body whorl with 8 spiral cords in 3 sizes
Diam. 23 mm. Santa Barbara to Panama ....antonii Koch
.. Sides of whorls not flattened or concave
... Sides of whorls angulated near the middle
.... Body whorl with 3 to 5 major spiral cords
Diam. 12 mm. Santa Cruz to San Diego .... tricolor Gabb
.... Body whorl with 15 or more spiral cords
Diam. 23 mm. Catalina to Gulf of California .. eximium Reeve
... Sides of whorls rounded, not angulated
.... Body whorl with a single spiral cord
Diam. 32 mm. Farallones to San Diego .... platinum Dall
.... Body whorl with more than one spiral cord
..... Spiral cords unequal in strength
...... Body whorl with 3 major spiral cords
Diam. 15 mm. San Pedro to Gulf of Calif. ... gemmulatum Carpenter
...... Body whorl with 6 major spiral cords
Diam. 12 mm. Gulf of Calif. ....gemmuloides Lowe
..... Spiral cords about equal in strength
...... Body whorl with 7 to 9 spiral cords
Diam. 18 mm. Sitka to San Diego .... costatum Martyn
...... Body whorl with about 13 spiral cords
.... Base with 20 spiral cords
Diam. 13.5 mm. Gulf of Calif. .... marshalli Lowe
.... Base with 16 spiral cords
Diam. 13 mm. Gulf of Calif................ angelenum Lowe

Genus *Solariella*

All sculpture obsolete

Diam. 19 mm. Monterey to Clarion Island .... *nuda* Dall

Sculpture distinct

• Spiral of fine threads

•• Axial sculpture of narrow, threadlike ribs

Diam. 2 mm. Catalina Island ....*rhyssa* Dall

•• Axial sculpture of numerous, oblique ribs

Diam. 6 mm. Arctic to San Diego .... *varicosa* M. & H.

• Spiral sculpture of prominent rows of keels

•• Axial sculpture present, fine

Diam. 8 mm. Forrester Island to San Diego .....*peramabilis* Carpenter

•• Axial sculpture absent

••• Spire with three strong spiral cords

Diam. 7 mm. San Diego to Panama ....*triplostephana* Dall

••• Spire with six major spiral cords

Diam. 15 mm. Galapagos ....*galapagana* Dall

Genus *Cidarina*

Spire with several major, equal spiral cords

Height 40 mm. Alaska to Cape San Quintin .....*cidaria* A. Adams

Spire with only two major spiral cords

• Spire with 2 minor cords in addition to the major

Height 21 mm. San Diego to Ecuador .... *equatorialis* Dall

• Spire without minor spiral cords

Height 28 mm. San Diego to the Gulf of Calif....*ceratophora* Dall

Genus *Clanculus*

Sculpture of 6 or 7 major and numerous minor spirals

Diam. 15 mm. Gulf of Panama ....*rubidus* Dall

Genus *Margarites*

Surface smooth or nearly so

• Shell depressed, surface bright and shining

Diam. 8 mm. Bering Sea to Catalina .... *helicina* Phipps

• Shell globose conical, surface dull

Diam. 3 mm. Puget Sound to San Diego .... *lacunata* Carpenter

Spire with 2 major and many minor spiral cords

• Base with 5 spiral threads

Diam. 3.5 mm. Alaska to San Diego ....*parcipicta* Carpenter

• Base smooth or with fine spiral striae

Diam. 5 mm. Alaska to San Diego ....*lirulata* Carpenter

Spire with 4 or 5 equal spiral cords

• Base with 5 spiral threads

Diam. Santa Barbara to Coronado Islands... *optabilis* Carpenter

• Base with 8 spiral threads

Diam. 4.5 mm. Bodega Bay to Coronado Islands ...*acuticostata* Carpenter

• Base with 12 spiral threads

Bering Sea to San Diego ....*pupilla* Dall

• Base with about 20 spiral threads

Diam. 11 mm. Alaska to San Diego .... *rhodia* Dall

Spire with 7 low spiral threads

Diam. 4 mm. Alaska to San Diego ....*succincta* Carpenter

Family Trochidae

Genus Norrisia Bayle,1880

Norrisia norrisii (Sowerby),1838	Monterey to Cerros Island

Genus Halistylus Dall,1889

Halistylus subpoideus (Tryon),1887	British Columbia to Panama

Genus Tegula Lesson,1832

T. (Chlorostoma) funebrale A. Adams,1854	Vancouver to Cerros Island
T. (Chlorostoma) gallina Forbes,1850	San Francisco to Gulf of Calif.
T.(Chlorostoma) montereyi Kiener,1850	Monterey to San Pedro
T. (Omphalius) ligulata Menke,1850	Monterey to Panama
T. (Omphalius)aureotincta Forbes,1850	Santa Barbara to Magdalena Bay
T. (Omphalius) mariana Dall,1919	Santa Barbara to Peru
T. (Chlorostoma) regina Stearns,1893	San Clemente to Gulf of Calif.
T. (Chlorostoma) rugosa A. Adams,1851	San Diego to Acapulco
T. (Omphalius) impressa Jonas	San Diego to Tres Marias Islands
T. (Omphalius) reticulata (Wood),1828	San Diego to Peru
T. (Omphalius) globula Carpenter,1857	Gulf of Calif. to Panama
T. (Omphalius) pellisserpentis (Wood),1828	Gulf of Calif. to Panama
T. (Omphalius) rufoflammulata Koch	Gulf of Calif. to Panama
T. (Omphalius) rufotincta Carpenter,1857	Gulf of Calif.
T. (Omphalius) panamensis (Philippi)	Panama
Tegula coronulata (C.B. Adams),1852	Panama
Tegula semirugosa (A. Adams),1851	Galapagos
Tegula cooksoni (E.A. Smith),1877	Galapagos
Tegula snodgrassi (Pilsbry & Vanatta),1902	Galapagos
Tegula quadricostatus Gray,1828	Peru and Chile
Tegula smithi (T. & G.),1874	Peru
Tegula patagonica (d'Orbigny),1840	Peru to Patagonia
Tegula eiseni Jordan	Pleistocene, Magdalena Bay
T. (Chlorostoma) barkeri Bartsch and Rehder,1939	Galapagos
Tegula tridentata (P. & M.),1838	Peru and Chile
Tegula atra (Lesson),1830	Peru and Chile
Tegula moesta (Jonas),1844	Peru and Chile
Tegula euryomphalus (Jonas),1844	Peru and Chile
Tegula luctuosa (d'Orbigny),1841	Peru and Chile
Tegula fuscescens (Philippi),1844	Peru and Chile
Tegula gaudichaudi Hupe,1854	Chile
Tegula lugubris (Philippi),1844	Chile
Tegula melaleuca (Jonas),1844	Chile

Genus Monodonta Lamarck

Monodonta nigerrima (Gmelin),1791	Peru and Chile
Monodonta crusoeana Pilsbry,1889	Peru and Chile

Genus Calliostoma Swainson,1840

Calliostoma splendens Carpenter,1864	Monterey to San Diego
Calliostoma annulatum(Martyn)1784	Alaska to San Martin Island
Calliostoma costatum (Martyn),1784	Alaska to San Diego
Calliostoma canaliculatum (Martyn),1784	Alaska to San Diego
Calliostoma variegatum Carpenter,1865	Puget Sound to Cerros Island
Calliostoma platinum Dall,1889	Farallones to San Diego
Calliostoma antonii Koch,1843	Santa Barbara to Panama
Calliostoma gloriosum Dall,1871	San Francisco to San Diego
Calliostoma eximium Reeve,1842	Catalina to Gulf of Calif.
Calliostoma gemmulatum Carpenter,1864	San Pedro to Gulf of California
Calliostoma tricolor Gabb,1865	Santa Cruz to Cape San Lucas
Calliostoma supragranosum Carpenter,1864	Monterey to San Diego
Calliostoma turbinum Dall,1865	Pt. Conception to San Diego

(con.)

Calliostoma palmeri Dall,1871 Gulf of Calif.
Calliostoma leanus C.B. Adams,1852 Gulf of Calif. to Panama
Calliostoma macandrae Carpenter,1856 Gulf of Calif.
Calliostoma lima Philippi,1850 Gulf of Calif. to Panama
Calliostoma marshalli Lowe,1935 Gulf of Calif.
Calliostoma gemmuloides Lowe,1935 Gulf of Calif.
Calliostoma angelenum Lowe,1935 Gulf of Calif.
Calliostoma bonita B.H. & S.,1933 off Acapulco
Calliostoma rema B. H. & S.,1933 Tres Marias Islands to Acapulco
Calliostoma nepheloidea Dall,1913 West Mexico to Panama
Calliostoma iridium Dall,1895 Panama
Calliostoma fonkii Philippi,1860 Peruand Chile
Genus Turcicula Dall,1881
Turcicula bairdii Dall,1889 Bering Sea to Coronado Islands
Turcicula macdonaldi Dall,1889 Panama
Genus Turcica A. Adams,1854
Turcica caffea Gabb,1865 San Pedro to Cape San Lucas
Genus Cidarina Dall,1909
Cidarina cidaris A. Adams,1864 Alaska to San Quentin
Cidarina ceratophora Dall,1895 San Diego to Mazatlan
Cidarina equatorialis Dall,1908 San Diego to Ecuador
Genus Gibbula Risso,1826
Gibbula adriatica canfieldi Dall,1871 Monterey to San Diego
Genus Solariella Wood,1842
Solariella peramabilis Carpenter,1864 Forrester Island to Coronado Island
Solariella rhyssa Dall,1919 Catalina
Solariella triplostephanus Dall,1910 San Diego to Panama
Solariella nuda Dall,1896 Monterey to Gulf of Calif.
Solariella elegantula Dall,1925 La Paz
Solariella ceratophora Dall,1896 Gulf of Calif.
Solariella equatorialis Dall,1908 Panama to Ecuador
Solariella galapagana Dall,1908 Galapagos
Genus Volutonia
Volutonia galapagana Dall,1918 Galapagos
Genus Clanculus
Clanculus rubida Dall,1908 Panama and Galapagos
Genus Margarites Leach,1847
Margarites parcipicta Carpenter,1864 Alaska to San Diego
Margarites pupilla Gould,1849 Bering Sea to San Diego
Margarites rhodia Dall,1920 Alaska to San Diego
Margarites simbla Dall,1913 Santa Barbara Island
Margarites succincta Carpenter,1864 Alaska to San Diego
Margarites lacunata Carpenter,1864 Neah Bay to San Diego
Margarites lirulata Carpenter,1864 Alaska to San Diego
Margarites acuticostata Carpenter,1864 Bodega Bay to Guadalupe Island

The above list and keys are all from Mr. A.M. Strong's notebook.

Family Trochidae

Genus Norrisia Bayle,1880. Type (by monotypy), Trochiscus norrisii (Spworby).

" Shell thick, conoidal, orbicular, covered by an epidermis, smooth; widely umbilicated, umbilicus surrounded by the callous extension of the columella; outer lip not thickened or sculptured" (Arnold).

Norrisia norrisii (Sowerby),1838. Monterey, Calif. to Cerros Island, L.C.

This species has been spelled with one i. The correct spelling is as above with two i- norrisii.

Dr. Joahua L. Baily Jr. makes an interesting comment on this species " Carpenter states that it has been reported that this species has a sinistral nucleus, and that if this should prove to be the case it should be removed from the Trochidae and placed in the Solariidae, which also has a sinistral nucleus."

Collecting data: Our experience has been to find this a comparatively common species and usually associated with the heavy marine algae. The best way to collect all you want is to get out into a kelp bed in a rowboat and simply pull them aboard. Common off Redondo Beach, San Pedro, Newport, and all points south as far as we worked on the coast of Lower Calif. We pick them up in the dredge but I think they were specimens simply knocked off of the kelp. (Burch)San Diego Bay at La Playa (Bristol); San Nicholas Island (Hemphill); San Pedro (Lowe); La Jolla (Bristol) (San Diego Museum).

Genus Halistylus Dall,1889. Type (by original designation and monotypy), H. columna Dall.

" Shell small, cylindrical, holostomate, polychromatic; operculum multispiral, coriaceous; dental formula 1/ X plus 4.4 plus X; type H. columna Dall. This group differs from Leiopyrga in its holostomate aperture and absence of spiral sculpture."

Halistylus pupoideus (Carpenter),1864. (H. subpupoideus (Tryon))

The consensus of opin on seems to be that Carpenter's name is valid and Tryon's name should be placed in the synonymy. This is following Grant and Gale and others.

Collecting data: This is a very common dredged shell. We have it from 10 to 40 fms. off Monterey; off Redondo Beach 10 to 25 fms.; It seems to prefer sandy bottom. Have sets from 14 fms. off Coronado Islands and from 8 fms. off Ballast Point, San Diego dredged by the late Dr. Fred Baker. Not uncommon in the Pleistocene of Hilltop Quarry, San Pedro, Calif. (Burch) La Jolla (Chaney); San Diego Bay (Dr. Baker); Kino Bay (Lowe); Scammon's Lagoon (Huey); San Pedro (Lowe) (San Diego Museum).

Dr. A. Myra Keen advises " I do not believe that pupoidea is to be regarded as a homonym of pupoides under the Rules. Hence, Carpenter's name will stand."

* Range- Forrester Island, Alaska to Panama. Type locality,Monterey.

Genus Tegula Lesson,1835 Type (by monotypy, fide Pilsbry,1889), Tegula elegans Lesson- Trochus pellis-serpentis Wood.

" Shell Trochoid or Turbinate, heavy, smaller than Trochus; columella twisted and usually terminating below in one or more obtuse projections or denticles; callosity spreading over umbilical region; umbilicus open or closed."

There are no species of Tegula s.s. in the California fauna.

Subgenus Chlorostoma Swainson,1840. Type (by subsequent designation, Herrmannsen,1846), Trochus argyrostomus Gmelin.

Grant and Gale, 1931, p.825 state of this subgenus " .. differs from Tegula s.s. in the more ventricose whorls, which rapidly increase in size until the penultimate whorl is reached, the body whorl showing a less rapid increase in diameter. This feature of growth gives the penultimate whorl an appearance of disproportionate size and produces a dome-like spire. The

(con.)

sculpture is variable, consisting of spiral ribs, or sometimes of numerous protractive riblets, irregular or granulose. The surface color is often dark purple or gray. Beneath the surface the shell is pearly. The aperture is very oblique, the outer lip being smooth and pearly within, the columellar lip bearing one or more obtuse denticles. The umbilicus is open or closed, a callus wash covering the umbilical region.

Chlorostoma differs from Calliostoma in its much heavier shell, dome shaped spire, less uniform spiral sculpture, teeth or small projections on the columellar or basal lip, and the dark or somble and unattractive outer shell layer. Calliostoma s.s. has an imperforate axis.

Section Chlorostoma s.s.

" With axial or spiral riblets or both, outer shell layer usually dark purple or black."

" Omphalius differs in its much reduced or entirely obsolete sculpture and its rather smooth, light-colored outer shell layer."

One reason for quoting Grant and Gale to such length is that many authors consider Chlorostoma of generic rather than subgeneric value. Woodring,1928 and many others follow this practice and it is possible that we may ultimately adopt this practice.

Tegula funebralis (A. Adams),1854. Vancouver Island, B.C. to Cerros Island, B.C. Type locality, California.

Collecting data: One of the most abundant species on the coast in our experience from Crescent City,Calif. to Todos Santos Bay, L.C. Not uncommon in some of the Pleistocene deposits siuscha s Timm's Point, San Pedro. (Burch Cape Colnett, L.C. (Lowe); San Nicholas Island, L.C. (Lowe);Duxbury Reef (Lowe); San Diego (Orcutt); Pt. Loma (Bristol); Piedras Blancas Light (Cass) (San Diego Museum).

Tegula funebralis subaperta (Carpenter),1864. Neah Bay, Wash. to San Diego. " with an umbilical pit."

Collecting data: One would think that these umbilicate varieties had no significance and perhaps they do not, but the collector is compelled to note that certain colonies seem to have this characteristic and others do not. I am disposed to think it should be considered a valid variety.

Tegula gallina (Forbes),1850. San Francisco Bay to the Gulf of California. Type locality " probably from the Mazatlan coast" (Forbes).

Collecting data: Our experience with this species has been of interest only in that it increases in size as the range goes south. Specimens from below Todos Santos Bay on the outer coast of Lower Calif. are rougher and larger until those from Boca de Playa are giants for the species. Several years ago P.M. Connolly made a trip to San Quintin Bay, L.C. and brought back specimens of almost unbelievable size. (Burch); many localities from Catalina Island down to many Lower Californian localities; exceptionally large from Guadalupe Island, L.C. (Miss Bristol, San Diego Museum).

Tegula gallina multifilosa Stearns,1893. San Pedro, Calif. to Guadalupe Island, L.C. Type locality, Guadalupe Island.

Collecting data: This variety multifilosa would seem to have little significance other than that I can direct you to entire coves along the Palos Verdes Hills coast and elsewh re andwager that every single specimen

(con.)

you collect will be of this form. In fact it is the common form all the way from Malaga Cove to San Pedro (Burch); Todos Santos Bay and Guadalupe Island (Dr. F. Baker).

Tegula gallina tincta (Hemphill),1893. Halfmoon Bay, Calif. to Socorro Island. Type locality not given.

Collecting data: Again this odd form seems to be found in colonies. The first I everr ran across was near La Jolla and it was possible to collect any number of them all showing the characters described including the yellow spot. What significance this has or what caused it I do not know. (Burch); Todos Santos Bay (Huey); San Diego (Hemphill); Bird Rock (Kelsey) La Jolla (Bristol); San Pedro and Cape Colnett (Lowe) (San Diego Museum).

Tegula gallina umbilicata Dall,1919. Santa Monica Bay (Burch) to San Quintin Bay, L.C. Type locality, San Quintin Bay.

Collecting data: Ag ain this umbilicate form seems to congregate in colonies. There is a small cove just south of Redondo Beach where in my experience every single specimen is umbilicate. In the next cove you will not find a one.

However, there seems to be some kind of overlapping here because this colony of umbilicate specimens to which I referred above are also very definitely multifilosa giving you your choice of whether you wish to call it umbilicata or multifilosa. Perhaps these varieties had allas well be placed in the synonymy since the varieties certainly overlap.

Tegula brunnea (Philippi),1848. Crescent City, Calif. to the Santa Barbara Islands (Dall). Type locality, Calif.

Collecting data; Our experience has been to find this a central California species. It is very abundant from Monterey to Cayucos. It seems to like a little more water than funebralis being found nearer the low tide mark. (Burch); Cayucos a nd Duxbury Reef (Lowe); Piedras Blancas Light (Cass); Half Moon Bay (Button); Bolinas (Hemphill); Point Sur (Gifford) (San Diego Museum.)

Tegula brunnea fluctuosa Dall,1919. Crescent City to San Nicholas Island, Calif. Type locality, Monterey, Calif.

Dr. A. Myra Keen writes an interesting comment here " Note that Dall described a Tegula brunnea fluctuata in Amer. Jour. Conch., vol.7, 1872, p. 130. Type locality, Monterey." I do not have this reference. Is this perhaps the same thing ?

Collecting data: This ribbed form in our experience may be expected to appear in the ratio of about 1 in 100 in all colonies. They are easily recognized and may have some significance. I think it doubtful. I thought that we found a larger percentage than usual of this form at San Simeon,Cal

Tegula rugosa (A. Adams),1851. San Diego, Calif. to Acapulco,Mex. Type locality not given.

This is another of those very doubtful records. Did anyone e ver hear of a specimen from San Diego ? We have it from many localities from Lower California and it is possible that a specimen might stray into San Diego but certainly it would be a stray IF not just an erroneous record. It is not of our fauna and should in my opinion be dropped from the list. It is of the Mexican fauna.

Tegula montereyi (Kiener),1850. Bolinas Bay to the Santa Barbara Islands California. Type locality, Monterey, Calif.

Dr. A. Myra Keen advises " Winckworth shows (Proc. Mal. Soc. vol. 21, p. 234) that Tegula montereyi was published by Kiener in 1850)."

Collecting data: All of our specimens of this species came from Monterey Bay from the kelp. (Burch); Duxbury Reef (Lowe); Cayucos (Lowe); Monterey (Oldroyd) (San Diego Museum).

Tegula regina (Stearns),1892. Catalina and San Clemente Islands south to Gulf of California. Type locality, on advice of Dr. A.M. Keen is " Guadalupe Island, holotype label, U.S.N.M."

Dr. Keen also advises " Tegula regina was first described by Stearns in 1892, Nautilus, vol. 6, p. 85"

Collecting data: This exceedingly rare shell has recently been taken in some numbers by Mr. H. Jacobs, by diving off Catalina Island. It is a beautiful and unique shell and found in very few collections.

Subgenus Promartynia Dall,1909. U.S. Geol. Surv. Prof. Paper 59, p. 94,1909. Type (by original designation), T. pulligo (Martyn).

This group is easily distinguished from the above by noting the umbilical area.

Tegula pulligo (Gmelin),1790. Sitka, Alaska to Natividad, L.C. (Cooke).

Dr. A. M. Keen advises on this species " Dall states (Proc. U.S.N.M. vol. 29, p. 423) that the King George's Sound of Martyn is actually Nootka Sound, sputhwest coast of Vanvouver Island. Martyn said " New Zealand", but probably Dr. Dall was right. Tegula pulligo may date from Gmelin,1790. Mrs. Oldroyd's taylori seems rather to be a topotype of pulligo than a subspecies."

Collecting data: There seems to be some variation in the shells we have so labelled from the north and those from Monterey and the south but they must all be the same species or something not described. We have fine specimens from Monterey Bay from the kelp; also from Cayucos; Morro Rock; Oceano,San Luis Obispo Co.; and we were very much surprised to bring up specimens apparently of this species from nearly 50 fathoms off Redondo Beach (Burch); Forrester Island, Alaska (Willett); Farallones Islands (Lowe); Monterey and Long Beach, Calif. (Lowe); Point of Rocks (Bristol); Point Loma (Chaney) (San Diego Museum).

Tegula pulligo taylori I. Oldroyd,1922. Marine shells of Puget Sound and Vicinity, Puget Sound Biological Station 4:171. Type locality, Hope Island at the north end of Vancouver Island and known only from the type locality. The consensus of opinion seems to be that this variety is of no signoficance and should be placed in the synonymy of the typical.

Mr. W.J. Eyerdam reports having taken typical pulligo from Clallam Bay, Stair of Fuca, Wash,1925; Craig, Prince of Wales Island, Alaska,1939 by Norberg.

Subgenus Omphalius Philippi,1847. Type (by subsequent designation, Herrmannsen,1847), Trochus rusticus Gmelin. Japan.

" Shell medium sized, body whorl subangular or rounded at the periphery umbilicate. Aperture oblique, elliptical. Inner lip bearing a heavy tooth at the base, below which lies a more obscure tooth-like swelling. Callus spreading from parietal wall toward and partly over umbilicus. Sculpture consisting of spiral threads or of crude protractive axial ribs." (Woodring,1928).

Tegula aureotincta (Forbes),1852. Santa Barbara Islands south to Santa Margarita Island (Stearns). Type locality: " Probably from the Mazatlan coast

Collecting data: Malaga Cove; San Pedro; Point Vicente; San Onofre; Punta Banda, L.C.; etc. This is not an uncommon medium tidal zone species. (Burch); San Diego (Hemphill); Pt. Loma (Kelsey); Todos Santos Bay (Dr. F. Baker); Magdalena Bay (Orcutt); Guaymas (Herrera)(San Diego Mus.

Tegula impressa (Jonas),1848. San Diego, Calif. to Tres Marias Islands. Mazatland and Manzanillo (Lowe) ('no California records) ?

Tegula ligulata (Menke),1850. Monterey, Calif. Moss Beach, Calif. (Voorhees to Acapulco, Mexico. Type locality, Mazatlan.

Dr. A. Myra Keen advises on this species as well as the following (Per. Comm. Nov. 1945) " I do not have the papers by Menke, Jonas, or Wood at hand to consult. However, at the National Museum I made the following notes based on specimens in that collection " Tegula ligulata ranges south to Real Llejos. There seems to be no true T. reticulata from north of Costa Rica; those so labelled are ligulata. The T. mariana from Santa Barbara looks to me like ligulata. the northernmost mariana in this collection is from Cape San Lucas."

We are therefore dropping the following species from our faunal list:

Tegula reticulata (Wood),1828. Range- south to Guayaquil. Type locality Gulf of Calif.

Tegula mariana (Dall),1919. Range- south to Peru. Type locality,La Paz. Reference- Pilsbry and Lowe, Proc. Acad. Nat. Sci. Phila. vol. 84:85

Collecting data for T. ligulata: Our experience has been to find this perhaps the most numerous species of the genus from Santa Monica Bay south to Todos Santos Bay in all rocky rubble. It is common on the off shore islands also. (Burch);

We will discuss the other genera of the family Trochidae in the next issue.

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The interesting little Bulletins of the Natural History Museum of San Diego are at hand for the months of November and December. They are expecting to have the Navy relinquish their building which has been being used as a hospital,and in the near future resume all of their normal activities. They seem to be enjoying a steady flow of new aquisitions from their members now scattered all over the earth. The mention of again receiving scientific journals from Europe was of interest also.

Mollusca, Vol. 1, no.7, Dec. 17,1945 published by Paul H. Reed, Tavares, Florida- rate $2.50 for 12 issues. Mr. Reed has brought out a very fine edition this time and should be congratulated.

Strombus jeffersonia Van Hyning is a new species well described and well figured in this issue.

Mr. Harold Harry, Rt. 2, Box 222, Shreveport, Louisiana. The following interesting note received with the very unusual Chinese Christmas card " Greetings from Tsingtao,China, to the Burches and all my friends of the Conchological Club of So. Calif. Expect to be in Seattle by late December and for a month following; after which may greet you of Los Angeles in person. After mid February please use home address. Have been getting the Minutes very rarely because of poor mail service, but am very grateful that you rem-

(con.)

membered me with them. When I'm home for good I'll have duplicates for everyone interested from such places as Eniwetok, Saipan, Ulittu, Ise Shima, Bouganville, New Caledonia, China, Lolelieu, Manus. I will begin to pay off my socio-conchological debts then.

W.J. Eyerdam, 7531 19th Ave., N.E., Seattle 5, Wash. " Mr. H. Harry is in Seattle on a warship at present and has been over to see me. He brought about 70 species of shells that he collected at Tsingtao, Ise Jima and the Palau Islands. I identified all except three or four of them for him. Dr. Myra Keen has just submitted the names of the critical species of shells that I sent her from this summers vacation. Five of them are new to my collection of Alaskan shells. On Raspberry Island I collected 104 species of shells, this year. I will submit the list pretty soon."

J.M. Grech, 57/59 Behind St.,; Ubaldesca, Paula, Malta. In years past the editor has exchanged extensively with Mr. Grech and many fine shells now in the cabinets bear his labels. Mr. Grech writes that a large part of his shell collection was destroyed in the bombings of Malta and that he is now eager to replace them and to exchange again extensively. Inasmuch as it is out of the question for the editor to handle such exchanges at this time the matter is called to the attention of other members who may be interested.

E.C. Jaeger, U.S. Engineer Dredge Sacramento, A.P.O. 180, c/o Postmaster San Francisco, Calif.

" I saw your September issue of the Minutes of the C.C. of S. Calif. and on the front page was a letter written to you by my Captain, S.L. Kimball. Captain Kimball has interested me, and shown me a lot of the tricks of shell collecting, and we have had many a fine hour together here on the reefs and shores of Okinawa. I have only been collecting four months now and have well over two hundred different species of shells from Ohinawa. I know nothing about shells at all and have to get all of my information from Captain Kimball, who is always willing to assist me within his power. I have collected a fine lot of shells for myself, and in the course of this collecting, have accumulated many duplicates. These I would like to sell, if it is possible. Captain Kimball suggested I write to you to see if you would help me out. All but very few of my shells were taken alive. Our system is to keep a dead shell until we find a live one and then discard the dead one. I have among my shells 25 different species of Conus, with 15 more probables. 18 different Cypraea with five probables, 3 species of Haliotis, Turbo, Conchs, 3 different Murex, Patella, Nerita polita and undata, Cerithium nodulosum, several Trochus Engina mendicaria, Bulla, several Vasum, a number of Mitra, several Pterocera, and numerous other shells that we do not know the names of. All our knowledge of these shells is gathered from the Handbook for Shell Collectors by Walter Webb. If you can notify me by return air mail, as to whether I could dispose of these shells, I would appreciate it very much. I am mailing out a small lot of them to you personally, for use by the club, rather than subscribe to the Minutes which are available to me through Captain Kimball. I sincerely hope to hear from you by return air mail as that is the quickest way."

Surely some of the club members will be interested in this deal.

Dr. Ascla B. Franco, Cebu City, Cebu, Philippines. It was a great pleasure to receive a long letter from Dr. Franco from whom we have in the past received many beautiful and rare shells. " ...... It was the Americal Division who liberated my own place from the Japs. And the 77th Division came over for a rest after their bloody campaign in Okinawa. These men and the Navy filled Cebu with Americans for the time being. Later, most of them went over for the occupation of Japan. (con.)

It was a miracle that my parents and myself came out alive in this war. The Japs are the most inhuman beings I have ever met with- they are just simply beasts. I have seen moving pictures before the war depicting the cruelties of the Germans and many of us here used to say that they were only propaganda/ But now we know better from the Japs who were much worse. They have done atrocities created only from a devil's mind. My place, Cebu received the heaviest damage in comparison with the rest of the Philippines. Most of the houses were burned either by bombing or by demolition. Personally, we lost eight houses including that of my downtown clinic. Our residence was spared us with two other houses. I have been visited by many American shell collectors. Some of thema re just beginners, others rather advanced, but most of them just shell souvenir hunters. To all of them I have given many of my available duplicates as my compliments for the sacrifices they made in this war. The bulk of my good duplicates were in my clinic. I had one big room for display and another roomfor deposits. You see, I occupied the whole building for my clinic and I converted two rooms for my shell hobby. The rest of the building was for my medical practice. All of this was burned including the bulk of my stamp duplicates. The minute I am free with my patients I go through my hobbies. Also I had a small warehouse where I deposited several thousands of Nautilus pomilius for American dealers and about fifty thousand Ovula ovum L. ready for export to New Guinea. Other bigger shells and the less delicate ones were kept in this place. This too was burned. My own personal collection I always keep in my own sleeping room. These I do not trust out of my sight or any other place. I was able to evacuate them to the mountains about sixty miles from the city. My best duplicates, which were at home, were mostly intact when we returned from evacuation. And these were the ones I gave to the Americans who came over to see me. During the Jap occupation nobody did any shell collecting. The souvenir hunters spoiled everything in prices- 50¢ to $1.00 for a simple Cypraea tigris and $30.00 or $15.-- for a Nautilus with a design of a map of the Philippines. I am expecting the prices to drop down when most of the Americans leave the islands. "

Rev. William Henry Fluck, Newfane, Vermont. " I thank you for sending me the Minutes of the Conchological Club of Southern California. I think it exceedingly helpful especially to one like myself isolated from other conhhologists. It is a great help to me in keeping the nomenclature of my California shells up to date.

In the October number, there was some question made as to the proper spelling of Ianthina. It is a well known fact that the letter J was but slightly distinguished by the ancients from the letter I. In English, I and J were originally calligraphic variations of the same letter, and stood fpr both the vowel and the consonant sound, but gradually, after about 1630, J came to be used for the consonant sound of dz or J as we now use it. In one of my dictionaries I read that " I and J were treated as the same letter in alphabetical arrangements as late as Todd's Johnson's Dictionary of 1818."

****

The following persons are perhaps interested in purchasing :

Leona Lagdowski, Burr Hall, Willimantic, Conn.

Walter Anderton, 19 Glen Ivis Park, B'ham, Alabama

Caroline Cobb, 18 Chestnut St., Boston, Mass.

Trochidae (Cont'd.)
Vitrinellidae
Fissurellidae
Scissurellidae (also No. 60!)

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
March 1946

These papers are published by a group of interested students for our own pleasure and financed by voluntary contributions of members and friends. It is not our intention to offer subscriptions and guarantee regular periodical publication. However, non-members of our club will be placed on our mailing list and receive all papers published for contributions to our fund of $2.50 per year or $1.25 each six months.

We are now meeting the first tuesday of each month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, Calif.

Please mail all news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.
Phone Ax 2-7965.

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The program we have been carrying on in our Minutes should serve as a supplement to the four volumes by Ida Shepard Oldroyd " The Marine Shells of the West Coast of North America", a Stanford University publication selling for $10.00 bound in cloth. We will be pleased to handle the orders of any of our members or friends wishing this set. It has been our intention to republish the original descriptions of all species described or added to our fauna since the publication of Mrs. Oldroyd's work in 1927.

****

Genus Calliostoma Swainson,1840. Type (by subsequent designation, Herrmannsen,1846), Trochus conulus Linnaeus (= " Calliostoma conula Mart.")

" Imperforate; spire elevated, acute; aperture broader than high, transversely ovate, hardly sinuated at the base, and slightly oblique; shells always smooth, and often polished." (Swainson).

Subgenus Zizyphinus Gray,1843. Type (by subsequent designation, Rehder,1937), Calliostoma canaliculatum (Martyn) = C. dolarius (Holten),1803.

Dr. A. Myra Keen advises us on this matter as follows (Per. Comm. Nov. 1945) " In a paper entitled " Notes on the nomenclature of the Trochidae", (Proc. Biol. Soc. Wash., vol. 50, pp. 115-116, 1937), Rehder shows that the name Zizyphinus Gray dates from 1843 (Gray in Dieffenbach, Travels in New Zealand, vol.2, p. 237). Rehder designates as type the West American species canaliculatus Martyn and comments that he does not know whether or not Zizyphinus is generically distinct from Calliostoma. Perhaps, since he has made a West American species the type, we might recognize Zizyphinus as a subgenus of Calliostoma for the time being. The first available specific name for canaliculatus is Trochus doliarius Holten,1803 (see Proc Malac. Soc. London, vol.25, pt.4, p. 149)."

Calliostoma doliarius (Holten),1803. (Calliostoma canaliculatum (Martyn). Izhut Bay, Afognak Island, Alaska (Eyerdam) south to San Diego, Calif.

Several color forms of this species have been described. If any of the members think they have any significance please advise. I propose to abandon them to the synonymy. At one time I thought nebulosum might be good but it

(con.)

runs right into the typical off San Diego, its type locality. I have a large series of them.

C. c. nebulosum Dall,1919- Type locality, San Diego (parvum Williamson)
C. c. transliratum Dall,1919- Type locality, Biorka Island,Sitka,Alaska.

Collecting data: We have collected this species from Crescent City, Calif. ; Monterey Bay dredged and picked from floating kelp; dredged off Redondo Beach, Calif. in 25 fms.; off Coronado,San Diego, Calif. on floating kelp; Imperial Beach, San Diego Co. on kelp (Burch); Puget Sound and the record given above extending the known range northward from Sitka to Afognak Island, Alaska (Eyerdam);

Calliostoma ligatus (Gould),1849. (C. costatum (Martyn),1784). Prince William Sound and westward to Kodiak Island (Eyerdam) south to San Diego, Calif. Dr. A. Myra Keen advises on this as follows (Per. Comm. Nov. 1945) " The type locality of C. costatum Martyn is " King George's Sound, New Zealand". However, the first available name for the species seems to be Trochus ligatus Gould,1849 (Proc. Boston Soc. Nat. Hist., vol.3, p. 91), type locality Puget Sound. Original description: " Testa solida, ovato-conica imperforata, costulis rotundatis flavescentibus ubique cincta, intervallis incarnatis concinne clathratis, ad apicem violacea: spira anfr. 6 convexis: apertura circularis; columella recta rotundata; labro crenulato: regio umbilicalis vix indentata. Alt. 3/4, lat. 2/3 poll." This was figured in the U.S. Exploring Expedition, Atlas,1852, pl. 12, fig.207 (reproduced by Tryon and Pilsbry, Manual Conchology, vol. 11, pl.16, fig.6). The name filosus Wood is not available, as I had previously thought, being homonymous."

Collecting data: Our experience has been to find this by far the most common littoral species of the genus. We have collected it from Crescent City, Calif. south to San Luis Obispo Co. but have never taken it in southern California. We dredged it in numbers on the shale off Monterey down to perhaps 20 fms. (Burch); " I have found this species all along the coast up to the Kodiak Islands. The largest specimens I have are from Izhut Bay and Raspberry Strait, Afognak Island. Extended geographical range- northward to Prince William Sound and westward to Kodiak Island" (W.J. Eyerdam); Sitka,Alaska and San Juan Island, Puget Sound (Lowe); Bear Bay, Peril Straits (Kate Stephens); * Note* there is a record in the San Diego museum from Acapulco, Mexico by Orcutt. This sounds so improbable that obviously such a radical southern extension of range should be carefully verified before publication ."

The variety caeruleum Dall,1919 is in the opinion of the majority a mere color form and to be found in all colonies, of no significance and to be abandoned to the synonymy along with another color form pictum Dall,1919 . However, Mr. W.J. Eyerdam reports that in his opinion caeruleum is a distinct color variety at least in Puget Sound and reports it from San Juan Islands. Lowe also has a set from Port Harford in the San Diego Museum so labelled.

Calliostoma variegatum Carpenter,1864. Forrester Island, Alaska (Willett) south to Cerros Island, L.C. Type locality, Puget Sound, Wash.

Collecting data: Dredged off Svalon, Catalina Island in 35 fms.; off Monterey in 20 fms. (Burch); dredged in Puget Sound near San Juan Island (T. Kincaid); San Juan Islands, Wash. (W.J. Eyerdam); Catalina Island, Calif. in 50 fms. and San Juan Islands, P.S. in 80 fms. (Lowe) (San Diego

Calliostoma platinum Dall,1889. Farallone Islands, Calif. to San Diego Type locality, Santa Barbara Islands in 414 fms.

(con.)

Collecting data: San Diego in 50 fms. (Grapp); Monterey in 122 fms. (Oldroyd) (San Diego Museum); Mr. John Strobeen acquired some of these brought up on fishermen's lines off Santa Cruz, Calif.

Calliostoma gloriosum Dall,1871. South of San Francisco to San Diego. Type locality, Soquel, north side of Monterey Bay.

Collecting data: Dredged off Monterey in 20 fms.; exceptionally huge and fine specimens dredged off Redondo Beach, Calif. in 25 fms. gravel(Burch); washed in on kelp at Imperial Beach, San Diego Co. (Mrs. J.A. Randall); Santa Cruz, Calif. littoral (Mrs. H.R. Turver); Coronado Beach (Galloway); Mission Beach in kelp roots (Chaney); La Jolla and San Pedro (Lowe); Monterey (Oldroyd) (San Diego Museum).

Calliostoma antonii (Koch in Philippi),1843 Santa Barbara, Calif. to Panama. This is another representative of the southern fauna with a doubtful California record. There are sets in the San Diego Museum in the Lowe Collection from Montijo Bay, Panama and Panama City, but none from north of Panama. Type locality was not given for the species.

Calliostoma eximium Reeve,1843 Catalina Island to Mazatlan, Mexico. Type locality, Payanam in 10 fms. Another species from the southern fauna and all records in local museums from south of the border.

Calliostoma tricolor Gabb,1865. Moss Beach (Vokes) south to Cape San Lucas. Type locality, San Pedro, Calif, probably although Half Moon Bay and San Diego also mentioned.

Collecting data: Dredged off Monterey in 20 fms. to 40 fms.; common off Redondo Beach, Santa Monica, etc. in 25-35 fms.; off Catalina Island in 35 fms. (Burch); San Diego Bay in 8 fms. (Hemphill); San Diego and Long Beach (Lowe) (San Diego Museum).

Calliostoma gemmulatum Carpenter,1864. Cayucos,Calif. (Burch) / San Pedro, Calif. to the Gulf of California. Type locality, San Diego- San Pedro area.

Collecting data: Our experience has been to find this species more or less common in littoral collecting although we have picked it up in dredgings as deep as 25 fms. off Redondo Beach. We have taken it littoral at Cayucos; bridge and wharf piles in Anaheim Bay; Balboa breakwater; Malaga Cove; and Ensenada,Mexico (Burch).

Calliostoma supragranosum Carpenter,1864. Monterey south to Pequena Bay, L.C. (E.K. Jordan). Type locality on advice of Dr. A.M. Keen " San Diego according to the holotype label".

Collecting data: Malaga Cove, L.A. Co., littoral; San Pedro breakwater (Burch); Imperial Beach, San Diego Co. washed in on kelp (Mrs. J.A. Randall) San Pedro (Oldroyd and Baker); San Pedro breakwater (Lowe) (San Diego Mus.)

Calliostoma splendens Carpenter,1864. Monterey south to Guadalupe Island (Strong and Hanna). Type locality on advice of Dr. A.M. Keen " Catalina Island according to the holotype label, U.S.N.M."

Collecting data: Dredged off Monterey, Calif. in 20-40 fms.; off Redondo Beach common in gravel 25 fms.; off Avalon, Catalina Island in 65 fms.; off Ensenada in Todos Santos Bay in 35 fms. (Burch); Mission Bay (Chaney); Catalina Island in 50 fms. (Lowe); San Pedro in 30 fms. (Lowe) (San Diego Museum.)

Calliostoma turbinum Dall,1895. Point Conception to San Diego and the Islands. Type locality, among the Santa Barbara Islands.

Collecting data: Dredged off Redondo Beach, Calif. in 75 fms. and also in 50 fms. (Burch); San Diego in 35 fms. (Gripp).

Calliostoma annulatum (Humphrey),1786. Dr. A. Myra Keen advises on this name as follows (Per. Comm. Nov. 1945) " According to Winckworth's Notes (Proc. Malac. Soc. London, vol. 25, pt. 4, p. 150,1943), we may cite Calliostoma annulatum as of Humphrey,1786. Presumably Humphrey cites Martyn's figures, so that the type locality would remain the same " New Zealand".

Range: Forrester Island,Alaska south to San Diego, Calif.

Collacting data: Dredged off Monterey in 15-20 fms.; off Morro Bay and Cayucos; off Redondo Beach, Calif. in 25 fms. mud and gravel; (Burch); Rocky Bay, San Juan Islands, Wash. Sh.and Mud in 45 fms. (Miss R.E. Coats); fine colored specimens washed in on kelp at Imperial Beach, San Diego Co. (Mrs. J.A. Randall); Orcas Island, Wash. in 10 to 30 fms. (Dr. Baker); Monterey on kelp (Hemphill); Forrester Island (Willett); Coronado Beach, San Diego Co. (Jerabeck and Todd) (San Diego Museum).

Genus Turcicula Dall,1881. Type (by monotypy), Margarita (Turcicula) imperialis Dall.

" Shell globosely conical, white, thin; umbilicus reduced to a chink under the thin callus of the upper part of the pillar lip; mouth rounded rectangular, margins all thin; columella concave; outer surface with tuberculose ridges." (Tryon and Pilsbry, Man. of Conch.)

Turcicula bairdii Dall,1889. Bering Sea south to Coronado Island. Type locality, off San Clemente Island in 414 fms.

Collecting data: Drier Bay, Knight Island, Prince William Sound, Alaska - dredged (Eyerdam); Off Point Loma, San Diego Co. in 200 fms. (Lowe)

Genus Turcica A. Adams,1854. Type (by monotypy), Turcica monilifera A. Adams.

Shell conoidal, thin, subdiaphanous, imperforate; whorls with transverse series of granules, the last rounded at the periphery; columella solid, spirally twisted at the upper part, ending below or anteriorly in an obtuse prominent point; outer lip thin, simple, acute." (Adams).

Turcica caffea (Gabb),1865. Monterey to Cape San Lucas. Type locality, Monterey in 20 fms.

Grant and Gale state " This shell looks something like a Calliostoma but has two twisted fold-like protuberances on the columella and a conspicuously channeled or depressed suture.

Collecting data: Dredged off Monterey in 20 fms.; common off Redondo Beach in gravel at 15 to 25 fms.; not uncommon in the Pleistocene of Timm's Point, San Pedro (Burch); from kelp washed in after storm at Imperial Beach, San Diego Co. (Mrs. J.A. Randall); San Pedro breakwater (E.P. Chace); Coronado in kelp roots (Bristol); La Jolla and San Pedro (Lowe) San DiegoM.

Genus Cidarina Dall,1909. Type (by original designation), Margarita cidaris A. Adams.

" Shell large, whitish, unicolor, with strong spiral sculpture, sharply nodose, the umbilicus closed by a reflexed layer of callus, the suture channeled." (Dall,1909).

(con.)

Grant and Gale comment on this genus as follows, p 838" This genus was originally differentiated as a section of *Margaritos* Leach, in Gray, 1847. It is distinguished from *Solariella* by its closed umbilicus."

Cidarina cidaris (Carpenter),1864. Izhut Bay, Afognak Island, Alaska,1922 dredged (Eyerdam) south to Cape San Quentin, L.C. Type locality, Neah Bay, Wash.

Collecting data: Dredged off Redondo Beach in 50 fms.; off Bluff Cove in 50 fms.; also in 75 fms; Pleistocene of Timm's Point, San Pedro (Burch); Mr. Eyerdam's record stated above is a northward extension of range from Kasaan Bay; Forrester Island, Alaska in 40 fms. (Willett); Puget Sound (Randolph-dredged); N. of Gabriola Id., B.C. (Oldroyd); Redondo Beach in deep water (Lowe).

Subgenus *Calliotropis* Seguenza,1903. Type (by original designation) *Trochus ottoi* Philippi.

Dr. A. Myra Keena dvises on this group as follows (Per. Comm. Nov. 1945 " There is no Solaricida Dall,1902. It should be *Calliotropis* Seguenza, 1903 (Bol. Soc. Geol. Ital., vol. 21, p. 462). Type (orig. des.), *Trochus ottoi* Philippi. Description (·freely translated): " Form related to *Ampullotrochus* Monterosato, differing by having whorls with two conspicuously projecting carinae above the suture,otherwise smoothly and evenly convex."

Cidarina carlotta Dall,1902. Queen Charlotte Islands, B.C. in 1588 fms. ooze.

Cidarina ceratophora Dall,1895. San Diego, Calif. to Mazatlan, Mexico in deep water. Type locality, La Paz, Gulf of Calif. in 1,421 fms.

Cidarina equatorialis Dall,1908. San Diego, Calif. to Ecuador in deep water. Type locality, off the Ecuador coast in 1,132 fathoms.

Genus *Solariella* Wood,1842 Type (by monotypy), *S. maculata* S. Wood.

" Shell small, spire low, inner layer nacreous, umbilicus very wide and deep. Aperture subcircular,almost parallel to the vertical axis of the shell, peristome attached to parietal wall along oonly small part of its circumference. Outer lip, as viewed from above, slightly convex forward between suture and periphery of body whorl. Basal lip virtually straight. Sculpture consuisting of spiral threads modified by fine axial threads. (Woodring).

Solariella peramabilis Carpenter,1864. Forrester Island, Alaska to San Diego and the Coronado Islands. Also Japan. (Dall). Type locality, Catalina Island in 30 to 120 fathoms.

Collecting data: Dredged off Redondo Beach in 50 and 75 fms.; off Avalon Catalina Island in 35 fms.; not uncommon in the Pleistocene of Timm's Point, San Pedro (Burch); Forrester Island, Alaska in 20-50 fms. (G. Willett); dredged in Puget Sound near the San Juan Islands. (T. Kincaid); San Juan Island (Eyerdam); Catalina Island in 35 fms. (Lowe).

Solariella triplostephanus Dall,1910. Off San Diego, Calif. and south to Panama in deep water. Type locality, off La Paz, L.C. in 12 fms. sand.

Coll. Data: Magdalena Bay in 10 fms. (Lowe); Manzanillo in 20 fms. and San Benito Island in 10 fms. (Lowe) (San Diego Museum).

Solariella rhyssa Dall,1919. Catalina Channel, Calif.

Solariella nuda Dall,1895. Monterey, Calif. to Clarion Island. Type locality, off Lower Calif. in 298 to 455 fathoms.
Collecting data: San Diego in 50 fms. (Gripp) (San Diego Museum).

Subgenus Macheroplax Friele,1877 Archiv. f. Math. og Naturvedensk for 1876, p. 311) Type (by subsequent designation, Pilsbry,1889), M. affinis (Jeffreys) = Margarita amabilis Jeffreys.

Solariella varicosa (Mighels and Adams),1841. Arctic Ocean to San Diego. Also Atlantic. Type locality, Bay Chaleur in stomach of a codfish.
Collecting data: Hinchinbrook Island, Pr. Wm. Sound, Alaska (dredged (Norberg); Illiuliuk Bay, Unalaska Island, Aleutians,1932; Izhut Bay, Afognak Island, Alaska,1922; Vadso,Norway, ex Tromso Museum (W.J. Eyerdam);

Solariella obscura (Couthouy),1838. Arctic Ocean to Straits of Juan de Fuca. Circumboreal. Type locality, Massachusetts Bay.
Collecting data: Illiuliuk Bay, Unalaska Island, Aleutians,1932(Eyerdam)
Mr. Eyerdam sent in a record for a subspecies with which we are not familiar. Any additional data will be appreciated. It is S. obscura bella Verkruzen and reported from Unalaska Island,Aleutian Islands in 1932.

Solariella paupercula (Dall), 1919. Arctic Ocean to the Aleutians. Type locality, Arctic Ocean north of Bering Straits.

Genus Margarites Leach in Gray,1847. Type (by monotypy), Helix margarita Montagu= Trochus helicinus Frbricius,1780
" Shell umbilicate, orbicular, conoidal or depressed, thin; not variegated; whorls rounded, smooth or spirally lirate; aperture subcircular, peristomesimple, acute, the margins approaching; columella arcuate, simple, thin." (Pilsbry).

Subgenus Pupillaria Dall,1909. Type (by original designation), Trochus pupillus Gould.
" Shell dull, trochiform, unicolor, strongly spirally striated, sometimes radiately ribbed, and with more numerous whorls. Chiefly temperate seas."(Dall)
Grant and Gale comment " There is less difference between Pupillaria and Lirularia than between either of the two and Margarites s.s. " " Lirularia is smaller than Pupillaria."

Margarites pupillus Gould,1849. Nunivak Island, Bering Sea to San Pedro, Calif.; to San Diego in deep water. Type locality, New Zealand but no doubt this is an error.
Collecting data: Dredged off Redondo Beach in 50 fms.; littoral from Crescent City; De Poe Bay, Oregon; a common littoral shell in the northern part of the range, but taken only by dredging in southern California. Not uncommon in the Pleistocene of Timm's Point, San Pedro (Burch)/; Puget Sound, Drier Bay,Knight Island, Alaska; Izhut Bay, Afognak Island (Eyerdam);

Margarites sordidus Hancock,1846. Arctic Coast, Bering Strait and the Okhotsk Sea. ? North Japan. Circumboreal.

Margarites cinereus (Couthouy),1838. Bering Strait to Port Etches,Alaska. Circumboreal. Type locality Massachusetts Bay.

Collecting data: Drier Bay, Knight Island, Alaska,1923 (Eyerdam); also 62 39 ' N 177 W in 55 fms. clay- Vega Expd. 5/8/1879 (Eyerdam); Frenchman's Bay, Maine (San Diego Museum)

Margarites vorticiferus Dall,1873. Bering Strait and Sea, south and east to Unalaska, Alaska. Type locality, Iliuliuk Harbor, Captain's Bay, Unalaska, Alaska. Collected fromtype locality by W.J. Eyerdam.

Margarites vorticiferus sharpii Pilsbry,1898. Unalaska to Port Althorp, Alaska. Type locality, Dutch Harbor, Unalaska.

Collecting data: Collected from the type locality by W.J. Eyerdam.

Margarites vorticiferus escarinatus Dall,1919. Southwest of Point Barrow, Arctic Ocean and south and east to the Aleutians.
Type locality: Sta. 22, N. Lat. 69 35' and W. Long. 163 27', in 11-12 fms.

Margarites salmoneus Carpenter,1864. Puget Sound to Cayucos, Calif. San Luis Obispo Co., Calif. (Burch). / to San Pedro,(Lowe) Type locality, Monterey and Santa Barbara Islands, Calif.

Collecting data: Dredged off Monterey in 15 fms.; Cayucos, Calif. littoral (Burch); near Arroya Grande, Calif. (Tremper); San Pedro (Lowe) (San Diego Museum).

Margarites rhodia Dall,1921. Port Althorp ,Alaska to San Diego, Calif. Type locality, Puget Sound, Vancouver Island and Neah Bay.

Collecting data: Crescent City, Calif. (E.P. Chace).

Margarites rudis Dall,1919. Bering Sea to Cook's Inlet, Alaska; also Kamchatka. Type locality, Coal Harbor, Shumagins,Alaska in 8 fms.

Margarites healyi Dall,1919. Arctic Ocean north of Bering Strait. Type locality, north of Bering Strait, Sta. 10 of U.S.S. " Corwin".

Margarites simbla Dall,1913. Off Santa Barbara Islands, Calif. Type locality, deep water off Santa Barbara Channel, Calif.

Subgenus Lirularis Dall,1909. Type (by originaldesignation), Margarita lirulata Carpenter.

" Shell small, dull-surfaced, with variable color patterns, strong spiral sculpture,and delicate axial sculpture. Tropical and warm temperate seas." (Dall)

In our Minutes #16, p. 3, October,1942, Mr. George Willett discussed this group. Excepts from Mr. Willett's paper follow:

" In the process of naming the Margarites of the subgenus Lirularia, which are so abundant in the Lower Pleistocene deposits of San Pedro, I found it necessary to study the characters of all the Pacific coast representatives in our collections. As this group has puzzled many west coast conchologists (myself included), it may be worth while to report the conclusions arrived at in this study for what they are worth.

It appears to me that there are only three rather variable species of Lirularia commonly represented in west American collections, these being Margarites succintus Carpenter,M. lirulatus Carpenter, and M. optabilis Carp/

(con.)

These three, by the way, are all grouped by Tryon under the oldest name, lirulatus. Although Dall gives the range of succintusas ' south to San Diego' all my specimens are from Alaska. This is the smallest member of the group, with smooth, rounded whorls, grayish in color, with black spirals which usually show plainly within the aperture.

Carpenter's description of Margarites lirulatus calls for a shell with 2 cords on the spire and about 8 on the base. The type locality is Puget Sound. Oldroyd's figure (reporduced from Dall) does not show such a shell; neither have I seen it in any collection, but I have examined few specimens from Puget Sound. The portion of the description of lirulatus quoted by Oldroyd from Tryon applies to a composite of the three species, only the first portion apparently referring to the shell Carpenter had when he described lirulatus. Specimens with from 7 to 9 spiral cords are abundant in some Pleistocene deposits at San Pedro; also, I have them from 20 fathoms off South Coronado Island and off San Pedro, and from 30 fathoms off Catalina. These, however, nearly always have 3 spirals, which in many specimens are acute, and probably should be called M. lirulatus acuticostatus Carpenter. Shore specimens from Cayucos, Point Vicente and Todos Santos Bay and a small series from 10 fathoms off Santa Cruz Island, have about 5 basal cords, thus resembling the figures of Dall and Oldroyd. This is probably the shell Carpenter described as parcipictus, which seems also to be a race of lirulatus . A few of my 20 specimens show a lesser number than 8 basal cords, thus indicating intergradation between parcipictus and lirulatus. Shore specimens from Ketchikan, Alaska are higher than typical, uncolored , with 2 cords on the spire, but only 5 on the base. These therefore, have the spire as described for typical lirulatus but the base of parcipictus. They may be Carpenter's M. lirulatus conicus. A small series from Point Reyes California given me by Dr. Gregg, are quite smooth, with an irregular number of spirals, and seem referrable to M. lirulatus obsoletus Carpenter.

Margarites optabilis Carpenter is figured by Oldroyd (copied from Dall) but, for some reason, the species is not included in her text. It is a pointed, grayish colored shell, occasionally longitudinally maculated with white, and more frequently with alternating white and dark spots on the peripheral keel. In my experience, this is an uncommon species, living, the only typical lot I have coming from 50 to 75 fathoms off Catalina Island. However, the large form, called M. optabilis knechti by Arnold is very abundant in the lower Pleistocene of San Pedro. Although this form has previously been reported as a fossil, and both Dall and Keen place the northern limit of the species optabilis in the vicinity of Santa Barbara, I have four specimens of M. optabilis knechti that were dredged off Forrester Island."

In the light of the above discussion there seems little question but that some lumping will ultimately be done with this group. However, at this time we will simply list the described species.

Margarites succinctus (Carpenter),1864. Sitka, Alaska (Dall) to Lower California (Keen). Type locality not given. / to San Martin Id., L.C.

Collecting data: Monterey on algae (Burch); Grant Island, Alaska (G. Willett); Redondo Beach, Skagit Co., Wash. (Eyerdam); San Martin Island, L.C. (Dr. F. Baker); So. Coronado Island (Baker); Monterey (Hemphill); Ketchikan, Alaska (Willett) (San Diego Museum).

Margarites funiculatus (Carpenter),1864. Neah Bay, Wash.

Margarites optabilis (Carpenter),1864. Santa Barbara, Calif. south to Coronado Islands (Kelsey). Type locality: San Diego-San Pedro area.

Original description: " Wider(than M. parcipicta) : decussated between ribs: 2 spiral lines inside umbilicus."

Collecting data: Catalina Island in 30 fms. (Lowe); San Pedro and Monterey (Lowe); So. Coronado Island in 3 fms. Identified by Dall. ' Dr. F. Baker) (San Diego Museum).

Margarites optabilis knechti Arnold,1903. Forrester Island, Alaska (Willett) and Pleistocene of San Pedro, Calif. Type locality, Pleistocene of San Pedro.

Margarites lacunatus (Carpenter),1864. Neah Bay, Wash to San Diego,Calif. Type locality, Neah Bay.

Margarites parcipictus (Carpenter),1864. Sitka, Alaska to San Martin Island (Baker) and to Guadalupe Island (Strong and Hanna). Type locality, Neah Bay, Wash.

Collecting data: In our experience this is an extremely common small dredged shell. We have it dredged off Monterey in 10-40 fms.; off Redondo Beach in 20-50 fms.; off Avalon, Catalina Island in 35 fms. (Burch); off South Coronado Island and off San Martin Island (Dr. F. Baker); Puget Sound and San Juan Islands (T. Kincaid) ; San Pedro and Monterey (Lowe); San Geronimo Island (Lowe);

The subspecies M. p. pedroanus Arnold,1903 seems to be a fossil species so far not reported living and should therefore probably better be dropped from our faunal list.

Margarites inflatulus Dall,1921. Puget Sound and Vancouver Island. New name for Margarita inflatula Carpenter.

Margarites lirulatus (Carpenter),1864. Port Etches, Alaska to San Diego. Type locality, Puget Sound and Vancouver Island.

Collecting data: Fauntleroy,Wash., Puget Sound, littoral; Monterey Bay in 10 fms. (Burch); Izhut Bay, Afognak Island, Alaska,1922 (Eyerdam); Catalina Island in 30 fms. (Lowe); Orcas Islanf (Dr. Baker); So. Coronado Island (Dr. F. Baker) (San Diego Museum).

Dr. A. Myra Keen advises on this species as follows (Per. Comm.) " In 1864 Carpenter says: M. lirulata , n.s. Small: operc. smooth: 2 sharp principal riblets on spire: outline variable. Var. subelevata, raised, livid: var.obsoleta, sculpture evanescent: var. conica, very tall with intercalary ribs, like G. parcipicta. All of these are listed as ' Puget Siund and Vancouver Island'. In 1865, Proc. ANSP, p. 61, he repeats this in Latin, with a few added words, as given by Mrs. Oldroyd. For conica he says: " t. valde elevata; lirulis acutis, aliis interdum intercalantibus; umbilico parvo. Long. .33, long. spir. .2, lat .25, div. 58." Puget Sound"

Margarites lirulatus conicus (Carpenter),1864. Grant Island, Alaska (Willett) to Puget Sound. Type locality, Puget Sound.

See discussion under lirulatus. Ketchikan,Alaska (Willett)

Margarites lirulatus obsoletus (Carpenter),1864. Puget Sound,to San Diego. See discussion under lirulatus. Midspit, San Diego Bay (Dr.F. Baker)

(con.)

M

Margarites subelevatus (Carpenter),1864. Neah Bay, Wash. to San Pedro(Lowe

Margarites acuticostatus (Carpenter),1864. Bodega Bay to Guadalupe Island (Strong and Hanna). Type locality, Santa Barbara, Calif.
Collecting data: San Martin Island, L.C. (Dr. Baker); San Simeon, Calif. littoral;

Margarites althorpensis Dall,1919. Granite Cove, Port Althorp,Alaska in 14 fathoms.

Margarites smithi Bartsch,1927. Proc. U.S.N.M. 70:32 China Point,Monterey, Calif.

Subgenus *Margarites* s.s.

Margarites helicinus (Phipps),1774.all coasts of Bering Sea, to Catalina Island, Calif. Type locality, north side of Spitzbergen.
Collecting data: Grant Island, Alaska (G. Willett); Ketchikan,Forrester Island, San Lorenzo (Willett); Vancouver Island (Button); Hoonah, Alaska (Kate Stephens); Frenchman's Bay, Maine (.Blaney) ((San Diego Museum); Drier Bay, Knight Island, 1923; Izhut Bay, Afognak Island,1922; Raspberry Strait, Raspberry Island, Alaska,1945; also Kobbebay, N. Spitzbergen, type locality, in 55 fms. clay coll. Odhner (W.J. Eyerdam).

Margarites helicinus excavatus Dall,1919. Amchitka and Middleton Islands, Alaska. Type locality, Constantine Harbor, Amchitka, Aleutians.

Margarites helicinus elevatus Dall,1919. Bear Bay, Baranoff Island, Alaska.

Margarites beringensis (Smith),1899. Arctic Ocean, Plover Bay, Commander Islands, and Petrel Bank, Bering Sea. Type locality, Commander Islands.

Margarites albolineatus (E.A. Smith),1899. All coasts of Bering Sea. Type locality, Commander Islands.

Margarites olivaceus (Brown),1827. St. Lawrence Island; Atka Island, Aleutians. Also Atlantic. Type locality, Greenock, Great Britain.
Collecting data: Dutch Harbor, Aleutians (Lowe).

Margarites pribilofensis Dall,1919. Arctic Ocean to off Pribiloff Islands, Bering Sea. Type locality, near Pribiloff Islands in 34 fathoms.

Margarites frigidus Dall,1919. Arctic Ocean and south to Nunivak Island, Bering Sea and Windfall Harbor, Admiralty Islands, Alaska. Type locality, Arctic Ocean north of Bering Strait.

Margarites marginatus Dall,1919. Arctic Oceanand Bering Sea, south to Oregon; also Atlantic. Type locality, Adakh Island, Aleutians.
Collecting data: Mole Harbor, Alaska (Kate Stephens); Afognak Island Alaska (Baker); Knight Island (Baker) (San Diego Museum); " on kelp fronds and rocks; Iliuliul Harbor, Unalaska Island,1932; Izhut Bay, Afognak Island, 1922; Raspberry Strait, Raspberry Island, 1945 (Eyerdam).

Margarites hypolispus Dall,1919. Arctic Ocean north of Bering Strait.

Margarites tenuisculptus (Carpenter),1864. Puget Sound and Vancouver Island, to South Coronado Island (Dr. F. Baker).

Margarites umbilicalis (Broderip and Sowerby),1829. Arctic Coast. Circum-boreal. Type locality, Oceano boreali.

Genus Margaritopsis Thiele,1906 (Nach. d. Deutsch. malak. Gessell., vol. 38, p. 15. Type (by original designation), Margarita frielei Krause. For description see Thiele's Handbuch, p. 46.

Margaritopsis frielei (Krause),1885. Bering Strait region. Type locality, St. Lorenzbai, one example (Krause).

Genus Gibbula Risso,1826. Type (by subsequent designation,Herrmannsen,1847), G. magus (Linnaeus) - Trochus magus Linnaeus.

" Shell conoidal, umbilicated; umbilicus cylindrical or infundibuliform; whorls frequently tuberculated above and with channeled suture; columella sometimes terminating in a tubercular tooth." (Tryon).

Gibbula adriatica canfieldi Dall,1871. Monterey to San Diego, Calif. Pleistocene. We have no Recent records of this species.

Family Cyclostrematidae (Vitrinellidae)

There has been some discussion of the proper family name to use. Dr. A. Myra Keen advises (Per. Comm.) " Since, according to Opinion 141 the oldest named genus in a family need not be taken as the type genus, Vitrinellidae can probably stand. However, I have not made an exhaustive search to see which family name was proposed the earliest.

Genus Vitrinella C.B. Adams,1850. Type (by subsequent designation, Bush,1897), Vitrinella helicoidea C.B. Adams.

" Shell small, thin, with a Helix-like low spire and a very wide umbilicus; sculpture absent except for growth lines; aperture ovate, with a margin projecting forward between the suture and the periphery of the body whorl; callus deposit on parietal wall. "

Grant and Gale comment " It is probable that Vitrinella should be considered a subgenus of Cyclostrema."

Reference- Baker, Hanna,and Strong,1938 " Proc. Calif. Acad. Sci. vol.23, no. 15, pp. 217-244, pls. 17-23. Excellent keys to the species of the genera covered.

Vitrinella williamsoni Dall,1892. San Pedro, Calif. to San Diego.

Collecting data: Laguna, Calif. (Lowe); Pt. Loma (Dr. Baker); Pleist-ocene of Baldwin Hills, Del Rey deposit (Burch).

Vitrinella oldroydi Bartsch,1907. Monterey to Pt. Abreojos,L.A. San Martin Island, L.C. Type locality, Point Loma, Calif.

Collecting data: Dredged off Monterey in 15 fms.; littoral at Cayucos, San Luis Obispo Co. on algae; also at San Simeon; La Jolla; dredged off Avalon, Catalina Island in 25 fms. (Burch); San Martin Island (Baker) " Can be taken in fair quantity living on and around the tail valve of Ischnochiton conspicuus where the Ischnochitons are living in old Pholad holes or crevices in the ledges." (E.P. Chace).

* Note* Discussion continued bottom of Page 19.

Family Vitrinellidae

The following keys and lists are from Mr. A.M. Strong's notebook.

With a callus or pad restricting or covering the umbilicus ..Teinostoma
Without callus pad, openly umbilicated
. Outer lip sinuated or waved ....Scissilabra
. Outer lip not sinuated or waved
.. Shell naticoid, spire elevated .... Ganesa
.. Shell flattened, spire low or sunken
... Umbilicus with axial ridges or folds .... Decomphala
... Umbilical walls smooth
.... Spiral sculpture absent or confined to the umbilical region... ... Vitrinella
.... Spiral sculpture present
..... Entire surface with equal spiral threads of incised lines.... .. Delphinoidea
..... Body whorl with one to six spiral keels
...... Axial sculpture absent .... Cyclostrema
...... Axial sculpture present .... Circulus

Dall uses the genus Ganesa for several minute shells from the west coast. These seem to be quite different from the east coast shells usually placed in the genus.

Decomphala was suggested by Bartsch as a subgenus under Vitrinella for species having axial sculpture on the umbilical walls. As we have a species with similar umbilical sculpture but with strong spiral sculpture instead of the smooth surface of Vitrinella it seems best to use it as a genus.

Delphinoidea seems to be a valid generic name and is used to take the place of Cyclostremella used by Dall and Bartsch. The northern species placed by Dall in the genus Leptogyra do not seem to differ in any material way.

Bartsch has said somewhere that the material used by Carpenter in describing many species which belong in the family was so poor that it would be better to call them indeterminate. However, the descriptions in most cases are full enough to arrange them in genera and pick out specific characters. Where redescribed shells from Mazatlan are said to be the same as C.B. Adams shells from Panama it may be questionable. Dall and Bartsch have used different names for genera in most cases.

Genus Ganesa

Umbilicus emarginated
. Umbilicus bordered by a keel
Diam. 1.2 mm. Mazatlan .... naticoides Carpenter
. Umbilicus bordered by 12-15 spiral striae
Diam. 4.5 mm. Panama .... panamensis Dall
Umbilicus not emarginated
. Entire surface with subgranular vermiculations
Diam. 2 mm. Galapagos .... piona Dall
. Entire surface with thread like axial folds
Diam. 2.5 mm. Galapagos .... filosa Dall

See Dall in Proc. U.S.N.M., vol.56, p.368 for notes. I have not seen the paper by Miss Bush mentioned by him. None of these species have been figured and we have not placed any of them. Dall's species are from very deep water.

Genus Cyclostrema

Interapaces between cords or keels sculptured
• Spiral cords or keels more than 2
•• Spiral cords 3
••• Umbilicus wide, open to the apex
Diam. 4.5 mm. San Pedro to Gulf of Calif. .... baldridgei Bartsch
••• Umbilicus narrow, deep
Diam. 1.5 mm. Gulf of Calif. to Panama ....exigua C.B. Adams
•• Spiral cords or angulations 5-6
••• Major cords smooth
Diam. 4.0 mm. Gulf of Calif. .... spiceri B.H. & S.
••• All spiral sculpture nodulous or beaded
Diam. 2.28 mm. Tres Marias Islands .... mariae B.H. & S.
Interspaces between cords without spiral sculpture
• Axial sculpture of fine threads
•• Spire showing 1 spiral cord or angulation
••• Base with 3 spiral cords or angulations
Diam. 1.4 mm. Cape San Lucas .... xantusi Bartsch
••• Base with 2 spiral cords or angulations
•••• Periphery flattened with a cord on each side
Diam. 0.9 mm. Panama .... perparva C.B. Adams
•••• Periphery sharply keeled
Diam. 1.0 mm. Panama ....janus C.B. Adams
•• Spire showing more than 1 spiral cord or angulation
••• Base with 2 spiral cords or angulations
Diam. 2.1 mm. San Pedro .... miranda Bartsch
••• Base with more than 2 spiral cords or angulations
•••• Spire nearly flat
Diam. 1.5 mm. Panama ....concinna C.B. Adams
•••• Spire moderately elevated
Diam. 1.1 mm. Bahia Honda, Panama .... maccullochae S. & H.
• Axial sculpture consisting of distinct ribs
•• Spiral cords or angulation 6
Diam. 1.3 mm. Panama ....adamsi Bartsch
•• Spiral cords or angulations 2 to 3
••• Base without spiral cords or angulation
Diam. 1.0 mm. Bahia Honda, Panama .... bartschi S. & H.
••• Base with a spiral cord or angulation
•••• Periphery flattened with a cord on each side
Diam. 0.8 mm. Mazatlan to Panama .... nodosa Carpenter
•••• Periphery angulated with a cord on the angle
••••• Shell flattly depressed
Diam. 1.0 mm. San Diego ....diegensis Bartsch
••••• Shell moderately elevated
Diam. 1.3 mm. Panama .... adamsi Bartsch

Genus Circulus

Shell with one spiral cord on the angulated periphery
• Umbilicus broad, edge rounded
Diam. 2.2 mm. Panama .... diomedae Bartsch
• Umbilicus sharply angled at the edge
Diam. 3.1 mm. Taboga Island, Panama ...... nicholsoni S. & H.
Shell with more than one spiral cord
• Spire without spiral cords
•• Periphery with a rounded spiral cord
Diam. 1.2 mm. Mazatlan ....annulatus Carpenter

(con.).

.. Periphery flattened, a spiral cord on each side
Diam. 0.85 Mazatlan ....cinctus Carpenter
. Spire with one or more spiral cords
.. Spiral cords confined to the peripheral region
Diam. 1.6 mm. La Paz ....lirops Bartsch
.. Spiral cords not confined to the peripheral region
... Spiral cords 2 or 3
.... Interspaces between cords with strong spiral threads
Diam. 1.5 mm. Tres Marias Islands .... madreensis B.H. & S.
.... Interspaces between spiral cords smooth or with fine striae
..... Periphery rounded
Diam. 1.5 mm. Panama .... modestus C.B. Adams
..... Periphery angulated
...... Spire moderately elevated
Diam. 1.8 mm. Panama ....tricarinata C.B. Adams
...... Spire depressed or sunken
.... Umbilicus bordered with a spiral cord
Diam. 2.5 mm. Panama ....valvatoides C.B. Adams
.... Umbilicus bordered with an angle only
Diam. 1.0 mm Mazatlan ....planospiratus Carpenter
... Spiral cords more than 3
.... Base with [illegible] spiral cords
..... Periphery angulated, with a cord on the angle
...... Umbilicus bordered by a spiral cord
Diam. 2.5 mm. Panama ....diomedae Bartsch
...... Umbilicus not bordered by a cord
Diam. 1.0 mm. San Diego ....cosmius Bartsch
..... Periphery not angulated
...... Periphery rounded
Diam. 0.75 mm. Mazatlan .... carinulatus Carpenter
...... Periphery flattened, with a cord on each side
.... Base with decussated sculpture
Diam. 1.3 mm. Mazatlan .... bifrontis Carpenter

Genus Delphinoidea
Umbilicus restricted by the body whorl in the adult
. Shell subglobose Diam. 1.6 Tres Marias Ids. .... stephensae B.H. & S.
. Shell depressed, turbonate
.. Spire but slightly elevated
Diam. 3.2 mm. Taboga Island, Panama ...... hambachi S. & H.
.. Spire moderately elevated
Diam. 1.6 mm. Taboga Island, Panama ....hannai S. & H.
Umbilicus not restricted
. Umbilicus small, cylindrical
.. Shell depressed, discoidal
... Base with spiral threads, spire smooth
Diam. 1.5 mm. Panama .... seminuda C.B. Adams
... Entire surface with thin spiral ridges
Diam. 2.0 mm. Panama ....ponceliana de Folin
.. Shell turbonate
... Spiral threads numerous equal close spaced
Diam. 2.0 mm. San Diego .... rossellina Dall
... Spiral threads subequal, unequally spaced
Diam. 5.0 mm. Cape San Lucas ....granti B.H. & S.

(con.)

Genus Scissalabra

Axial sculpture present
. Sculpture finely decussated
.. Spire moderate elevated
Diam. 1.4 mm. Mazatlan .... monile Carpenter
.. Spire flattened
Diam. 1.0 mm. Mazatlan .... monilifera Carpenter
. Sculpture not finely decussated
.. Body whorl with 1 spiral keel
Diam. 0.95 mm. Mazatlan ....carinata Carpenter
.. Body whorl with more than 1 spiral keel
... Body whorl with 4 spiral keels
Diam. 1.25 mm. Mazatlan to Panama .... parva C.B. Adams
... Body whorl with 5 spiral keels
Diam. 1.6 mm. Mazatlan to Panama ....panamensis C.B. Adams
Axial sculpture absent
. Whorls angulated
.. With a sharp angle at the periphery
Diam. 1.0 mm. Monterey to Gulf of Calif. .... dalli Bartsch
.. Broadly angulated below the periphery
Diam. 1.0 mm. Mazatlan ....subquadrata Carp.
. Whorls not angulated
.. Spiral sculpture present
... Spiral cords at the suture and periphery
Diam. 1.4 mm. Mazatlan .... bifilata Carpenter
... Several spiral threads at the periphery
Diam. 0.8 mm. Mazatlan .... orbis Carpenter

Genus Vitrinella

Surface with irregular impressed lines
Diam. 2.1 mm. Cayucos to Pt. Sbreojos .... oldroydi Bartsch
Surface smooth or with fine lines of growth
. Umbilicus narrow, columellar walls straight
.. Umbilicus open to the apex
Diam. 1.9 mm. Gulf of California ....tiburonensis Durham
.. Umbilicus not open to the apex
Diam. 2.3 mm. San Pedro .... eschnauri Bartsch
. Umbilicus wide, columellar walls rounded
.. Shell flattened, spire scarcely elevated
Diam. 5.5 mm. San Pedro ....williamsoni Dall
.. Shell turbonate, spire moderately elevated
... Ratio of height to diameter 1 to 2
Diam. 1.2 mm. San Pedro .... smithi Bartsch
... Ratio of diameter to height 1 to 1.6
Diam. 1.6 Gulf of California .... guaymasensis Durham

Genus Decomphala

Early whorls with axial sculpture
. Spiral sculpture present
Diam. 2.42 mm. Cape San Lucas ....lowei B. H. & S.
. Spiral sculpture absent
Diam. 3.8 mm. Monterey to Newport .... stearnsi Bartsch
Early whorls without axial sculpture
. A single spiral keel on the base
Diam. 2.2 mm. Monterey to San Diego .... berryi Bartsch
. Three spiral keels on the periphery- Bahia Honda... bakeri S. & H.

• Umbilicus broad, open to the apex
•• Spire moderately elevated
Diam. 1.2 mm. Gulf of Calif. .... spiritualis B.H.& S.
•• Spire depressed
••• Apex lower than the last whorl
Diam. 2.3 mm. Monterey to San Diego .... californica Bartsch
••• Apex projecting slightly above the last whorl
•••• A smooth base between suture and first spiral
Diam. 1.5 mm. Cape San Lucas .... lucasana B.H. & S.
•••• Entire surface spirally threaded
••••• Spiral threads wavy, irregular
Diam. 1.3 mm. Gulf of Calif. .... dalli Bartsch
•••• Spiral threads subequal, equally spaced
Diam. 2.0 mm. Olga, Wash. .... concordia Bartsch

Genus Teinostoma

Shell angulated
• Periphery rounded - angulated at shoulder & middle/ of base
Diam. 1.5 mm. Bahia Honda,Panama ..., oschnauri S. & H.
•• But one angulation
••• Angulated above the periphery
Diam. 2.0 mm. Monterey to Gulf of Calif. ......supravallata Carp.
••• Angulated at the middle of the base
Diam. 2.0 mm. Monterey to Gulf of California .. invallata Carpenter
Shell not angulated
• Whorls finely sculptured
•• Incised axial lines present
••• Spiral sculpture absent
Diam. 1.0 mm. Panama .... minuta C.B..Adams
••• Spiral sculpture present
•••• Last whorl not produced
Diam. 1.2 mm. Mazatlan .... pyricallosa Carpenter
•• Incised axial lines absent
••• Spiral striae near the suture only
Diam. 1.0 mm. Mazatlan ....substriata.Carpenter
••• Spiral striae over entire surface
•••• Shell flatly depressed
Diam. 1.0 mm. Mazatlan .... lirulata Carpenter
•••• Shell subglobose, with a flattened spire
••••• Spiral striae subrugose
Diam. 1.1 mm. Mazatlan .... pallidula Carpenter
••••• Spiral striae very fine
Diam. 0.95 mm. Mazatlan................ tumens,Carpenter
• Whorls smooth, without sculpture
•• Spire depressed, with flattly impressed sutures
••• Body whorl greatly produced
•••• Maximum diameter less than 3 mm.
Diam. 2.75 mm. Gulf of Calif. .... amplectans Carpenter
•••• Maximum diameter more than 3 mm.
Diam. 3.5 mm. Magdalena Bay............ cecinella Dall
••• Body whorl not greatly produced
•••• Umbilical area with a small linguiform pad only
Diam. 2.0 mm. San Diego .... bibbiana Dall

(con.)

.... Umbilical area with more than linguiform pad
..... Callus leaving a slight umbilical chinck
Diam. 2.0 mm. San Pedro ....sapiella Dall
.. Spire moderately elevated
... An impressed line just below the suture
Diam. 1.75 mm. Panama .... regularis C.B. Adams
... Without an impressed line below the suture
.... With a minute umbilical dimple
Diam. 1.8 mm. Coronado Islands .... salvania Dall
.... With a distinct umbilical chink
Diam. 1.1 mm. Bahia Honda, Panama ...... hemphilli S. & H.

Genus Vitrinella C.B. Adams,1850

Vitrinella oldroydi Bartsch,1907	Cayucos to Pt. Abreojos
Vitrinella eschnauri Bartsch,1907	San Pedro
Vitrinella williamsoni Dall,1892	San Pedro
Vitrinella smithi Bartsch	San Pedro
Vitrinella guaymasensis Durham	Gulf of Calif.
Vitrinella tiburonensis Durham	Gulf of Calif.

Genus Decomphala

Decomphala berryi(Bartsch),1907	Monterey to San Diego
Decomphala stearnsi(Bartsch),1907	Monterey to Reef Pt.
Decomphala lowei(Baker,Hanna and Strong)	Cape San Lucas
Decomphala bakeri Strong and Hertlein	Bahia Honda, Panama

Genus Delphonoidea Brown,1927

Delphinoidea californica (Bartsch),1907	Monterey to San Diego
Delphinoidea rossellina(Dall),1919	San Diego
Delphinoidea dalli (Bartsch),1911	Gulf of California
Delphinoidea lirulata (Carpenter),1856	Mazatlan
Delphinoidea decussata (Carpenter),1856	Mazatlan
Delphinoidea granti B. H. & S.,1938	Cape San Lucas
Delphinoidea lucasana B.H. & S.,1938	Cape San Lucas
Delphinoidea spiritualis B.H. & S.,1938	Gulf of Calif.
Delphinoidea stephensae B.H. & S.,1938	Tres Marias Islands
Delphinoidea seminuda (C.B. Adams),1852	Panama
Delphinoidea porcellana (de Folin)	Panama
Delphinoidea hannai Strong & Hertlein	Panama
Delphinoidea humbachi Strong & Hertlein	Panama

Genus Cyclostroma Marryatt,1818

Cyclostrema baldridgei Bartsch,1911	San Pedro to Gulf of Calif.
Cyclostrema miranda Bartsch,1911	San Pedro
Cyclostrema diegensis Bartsch,1907	San Diego
Cyclostrema exigua (C.B. Adams),1852	Mazatlan to Panama
Cyclostrema nodosa (Carpenter),1856	Mazatlan
Cyclostrema coronata (Carpenter),1856	Mazatlan
Cyclostrema xantusi Bartsch,1907	Cape San Lucas to Panama
Cyclostrema ornata (Carpenter),1865	Mazatlan
Cyclostrema tenuisculpta (Carpenter),1865	Mazatlan
Cyclostrema lowei B.H. & S.,1938	Cape San Lucas - Decomphala-
Cyclostrema mariae B.H. & S.,1938	Tres Marias Islands
Cyclostrema spiceri B.H. & S.,1938	Gulf of California
Cyclostrema preparva (C.B. Adams),1852	Panama
Cyclostrema janas (C.B. Adams),1852	Panama
Cyclostrema concinna (C.B. Adams),1852	Panama
Cyclostrema adamsi Bartsch,1911	Panama

(con.).

Cyclostrema bartschi Strong & Hertlein Panama
Cyclostrema mcculloughi Strong & Hertlain Panama
Genus Circulus Jeffreys,1865
Circulus cosmia Bartsch,1907 ? Catalina- Ecuador
Circulus cerrosensis Bartsch,1907 Cerros Island to Gulf of California
Circulus annulata (Carpenter),1856 Mazatlan
Circulus planospira (Carpenter),1856 Mazatlan
Circulus cincta (Carpenter),1856 Mazatlan
Circulus carinulata (Carpenter),1856 Mazatlan
Circulus bifrontia (Carpenter) Mazatlan
Circulus verreauxii (Fischer),1857 Gulf of Calif.
Circulus liriope Bartsch,1911 La Paz
Circulus madreensis B.H. & S.,1938 Tres Marias Islands
Circulus modesta (C.B. Adams),1852 Panama
Circulus valvatoides (C.B. Adams),1852 Panama
Circulus tricarinata (C.B. Adams),1852 Panama
Circulus diomedae Bartsch,1911 Panama
Circulus bakeri Strong and Hertlein Bahia Honda,Panama- --Decomphala-
Circulus nicholsoni Strong & Hertlein Taboga Island, Panama
Genus Scissilabra Bartsch,1907
Scissilabra dalli Bartsch,1907 Monterey to Gulf of Calif.
Scissilabra parva C.B. Adams,1852 Mazatlan to Panama
Scissilabra panamensis C.B. Adams,1852 Mazatlan to Panama
Scissilabra subquadrata Carpenter Mazatlan
Scissilabra bifilata Carpenter Mazatlan
Scissilabra orbis Carpenter Mazatlan
Scissilabra monilo (Carpenter),1857 Mazatlan
Scissilabra monilifera Carpenter Mazatlan
Genus Ganesa
Ganesa naticoides Carpenter Mazatlan
Ganesa panamensis Dall,1902 Panama
Ganesa piona Dall Galapagos
Ganesa filosa Dall Galapagos
Genus Teinostoma A. Adams,1854
Teinostoma invallata (Carpenter),1864 Monterey to Gulf of Calif.
Teinostoma supravallata (Carpenter),1864 Monterey to Gulf of Calif.
Teinostoma sapiella Dall,1919 San Pedro to San Diego
Teinostoma bibbiana Dall,1919 San Diego
Teinostoma salvania Dall,1919 Coronado Islands
Teinostoma cacinella Dall,1919 Magdalena Bay
Teinostoma gallegosi Jordan Magdalena Bay, Pleistocene
Teinostoma amplectans (Carpenter),1856 Gulf of Calif.
Teinostoma substriata Carpenter,1856 Mazatlan
Teinostoma pyricallosa (Carpenter),1856 Mazatlan
Teinostoma lirulata (Carpenter),1856 Mazatlan
Teinostoma tumens (Carpenter),1856 Mazatlan
Teinostoma pallidula (Carpenter),1856 Mazatlan
Teinostoma carinata (Carpenter),1856 Mazatlan
Teinostoma regularis C.B. Adams,1852 Panama
Teinostoma minuta C.B. Adams,1852 Panama
Teinostoma hemphilli Strong & Hertlein Taboga Island, Panama
Teinostoma oschneri Strong and Hanna Bahia Honda, Panama

The following genera are not represented in the California fauna, but are listed and discussed in Mr. A.M. Strong's notebook for the southern fauna.

Genus Discopsis
Discopsis panamensis Bartsch,1918 Panama
Discopsis argentea Bartsch,1918 Panama
Genus Gaza Watson,1879
Gaza rathbuni Dall,1889 Galapagos

Genus Coronado
Coronado simonsae Bartsch Coronado Islands
Genus Alleorus Strong
Alleorus deprellus Strong Gulf of California

Family Neritidae
Genus Nerita Lamarck
Nerita scabricostata Lamarck,1822 Lower Calif. to Peru
Nerita bernhardi Recluz,1850 Lower Calif. to Peru
Nerita ornata Sowerby,1824 Nicaragua to Panama
Nerita cerostoma Troschel,1852 Peru
Genus Neritina Lamarck
Neritina picta Sowerby,1832 = usurptrix Cross & Fischer Magdalena Bay-Panama
Neritina cassicula Sowerby Gulf of Calif.
Neritina californica Reeve Gulf of Calif.
Neritina latissima Broderip,1832 Costa Rica to Peru
Neritina sobrina Recluz,1849 Peru
Neritina owenii Mawe Costa Rica and Peru

Genus Phenacolepas
Phenacolepas magdalensis Dall,1918 Magdalena Bay
Phenacolepas osculans C.B. Adams,1852 Gulf of Calif. to Panama
Phenacolepas malonei Vanatta,1912 Santa Rosalia

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Discussion of Vitrinella continued from bottom of Page 11

Vitrinella eshnauri Bartsch,1907. Monterey to San Diego to Scammons Lagoon
Type locality, San Pedro.

Collecting data: Dredged off Avalon, Catalina Island in 35 fms. (Burch) San Pedro (Lowe); Pt. Loma (Dr. Baker); Reef Point, 10 fms. (Strong); Scammons Lagoon (Baker).

Vitrinella alaskensis Bartsch,1907. Unalaska, Alaska.

Genus Docomphala Bartsch,1907. Type (by original designation), Vitrinella stearnsii.

Docomphala stearnsii(Bartsch)1907 Monterey, Calif. to South Coronado Island. (Baker). Type locality, Monterey.

Collecting data: Dredged off Redondo Beach in 25 fms. gravel (Burch); off South Coronado Island in 18 fms. (Dr. F. Baker); Not uncommon in the Pleistocene of Timm's Point, San Pedro, Calif. (Burch)

Docomphala berryi (Bartsch),1907. Monterey to So. Coronado Island.
Type locality, off Del Monte, Monterey.

Collecting data: Dredged off Malaga Cove, L.A. Co. in 20 fms. (Burch); So. Coronado Island in 18 fms. (Baker); Bird Rock (Baker).

Docomphala columbiana Bartsch,1921. Proc. Biol. Soc. Wash. 34:39
Departure Bay, British Columbia.

Vitrinella smithi Bartsch,1927. White's Point, Los Angeles Co., Calif. to South Coronado Island (Dr. F. Baker).
Type locality, White's Point, San Pedro.

Genus Cyclostrema Marryatt,1818. Type (by monotypy), C. cancellata Marryatt.
" Shell orbicular, depressed, widely umbilicated, spire short; whorls transversely striated or cancellated; aperture round, not nacreous; peristome continuous, simple." (Tryon).

Cyclostrema diegensis Bartsch,1907. San Diego, Calif.

Cyclostrema miranda Bartsch,1921. San Pedro, Calif. to Point Loma (Baker)
Type locality, San Pedro.

Cyclostrema baldridgae Bartsch,1911. San Pedro to Gulf of Calif.
Type locality, Gulf of Calif.
Collecting data: Dredged near Fort Rosecrans, Pt. Loma (Dr. F. Baker).

Genus Circulus Jeffreys,1865 Type (by monotypy), Delphinula duminyi Requien,1848 & Circulus striatus (Philippi),1836.

Circulus rossellinus Dall,1919. San Diego to Guadalupe Island (Strong and Hanna). Type locality, off South Coronado Island in 3 fathoms.

Circulus cosmius Bartsch,1907. Catalina Island, Calif. to Ecuador.
Type locality, near Atacamos, Ecuador.

Genus Skenea Fleming,1825. Type (by subsequent designation, Gray, 1847), Helix serpuloides. (Delphinoidea Brown,1827).
Dr. A. Myra Keen advises on this genus as follows (Per. Comm.)
" Delphinoidea Brown,1827, seems to be an exact synonym of Skenea Fleming , 1825, having the same type by subsequent designation (Gray,1847): Helix serpuloides Montagu. For discussion see Iredale, Proc. Malac. Soc. vol. 11, 1915, p. 292."

Skenea californica (Bartsch),1907. Monterey to Point Abreojos (Jordan).
Type locality, Long Beach, Calif.
Collecting data: Point Loma, San Diego Co. (Baker).

Skenea concordia (Bartsch),1920. Olga, Washington.

Skenea coronadoensis(Arnold),1903, Mem. Calif. Acad. Sci. vol.3, p. 320, 1903/
Collecting data: Spanish Bight, San Diego (Kate Stephens); Todos Santos Bay (Burch).

Genus Scissilabra Bartsch,1907. Type (by original designation), Scissilabra dalli Bartsch.

Scissilabra- " Vitrinella-like shells with the middle of the outer lip deeply and broadly notched, the center of the notch coinciding with the periphery of the shell" (Bartsch).

Dr. Joshua L. Baily Jr. comments on this (Per. Comm.) " Genus Scissilabra. I do not know this genus. The name means split lip, which suggests that it would be more appropriately placed in the Scissurellidae. I have collected both species of Teinostoma , and believe that the channel parallel to the suture of one of them indicates close relationship to the Scissurellidae, but not close enough to be transferred to that family. These species were formerly included in the genus Ethalia . I am not familiar with the types of these genera, but am inclined to believe that if Teinostoma has such a channel and Ethalia does not, or vice versa, these twp species should be placed in separate genera. If you can find out what the type of Ethalia is, I would suggest that this genus should be included in the faunal list, even though it may not be represented in the faunal area which you are covering."

Scissilabra dalli Bartsch,1907. Monterey, Calif. to the Gulf of California
Type locality, San Diego, Calif.

Dr. A. Myra Keen writes on this species (Per. Comm.) " In Mrs. Oldroyd's " Marine Shells", vol. 2, pt.3, pl. 104, figs. 10-12 are not of Scissilabra dalli but of Cyclostremella dalli Bartsch, from the Gulf of California. "

Genus Leptogyra Bush,1897. Type (by original designation), L. verrilli Bush.

Mr. Strong placed this under Skenea, or rather Delphinoidea in his usage.

The completeand rather detailed generic description is given by Oldroyd vol.3, p. 225.

Leptogyra alaskana Bartsch,1910. Port Graham, Cook's Inlet, Alaska.
Type locality, Port Graham, Alaska.

H &
Genus Teinostoma A. Adams, 1854. Type (by subsequent designation, Cossman n) 1888), T. politum A. Adams.

" Shell orbicular, depressed, subspiral, polished or spirally striated, last whorl rounded, or angulated at the periphery; umbilical region covered with a large, flat callosity; aperture transverse; inner lip smooth, callous; outer lip thin, simple, not marginated or reflected." (Tryon).

Dr. A. Myra Keen advises on this genus as follows (Per. Comm.) " As Teinostoma is a neuter noun, all adjectival endings should be in -um, as supravallatum, invallatum and bibbianum. The names sapiella and salvania may be nouns in apposition, though Dall's intention is not clear. The original description of T. supravallatum Carpenter,1864 is : " Minute, with keel and furrow near suture."

Teinostoma supravallatum (Carpenter),1864. Monterey to Gulf of Calif.
Type locality, an advice of Dr. Keen " San Diego according to the holotype label in thq U.S.N.M."

Collecting data: Dredged off Avalon, Catalina Island in 35 fms.; Malaga Cove littoral; Punta Banda, L.C.; Dana Point, Orange Co. (Burch); San Diego (Hemphill and Baker); La Jolla and Bird Rock(Bristol);S. Coronado Id.(Baker)

Teinostoma invallatum (Carpenter),1864. Monterey to the Gulf of Calif.
Type locality: San Diego.

Collecting data: Malaga Cove, L.A. Co., littoral; (Burch); Point Loma, San Diego Co. (W.K. Emerson); San Diego (Hemphill and Baker); Laguna Beach (Lowe); So. Coronado Island (Baker) (San Diego Museum).

Genus Pseudorotella Fischer,1857. Type (by monotypy), Rotella semistriata d' Orbigny. (fide Woodring,1928, p. 445)

" Shell small, moderately thin or thick, circular, spire low. Outer lip, as viewed from above, arched backward between the suture and periphery. Basal lip, as viewed from below, arched backward. Umbilicus covered with moderately thick subcircular callus that covers only small part of base and fails to reach suture. Parietal callus overlapping only small part of umbilical callus, thickened and slightly channeled where it meets outer lip, extending down on part of basal lip as very narrow border causing it to appear everted. Sculpture (of type species) consisting of very fine spiral threads on spire and on upper part of body whorl." (Woodring,1928, p.445).

Pseudorotella sapiella (Dall),1919. San Pedro to San Diego, Calif.
Type locality, San Pedro, Calif.

Collecting data: Laguna Beach, Calif. (Brown).

Pseudorotella bibbiana (Dall), 1919. San Diego, Calif.

Pseudorotella salvania (Dall), 1919. Off Coronado Islands.

Genus Solariorbis Conrad,1865. Type (by subsequent designation Dall,1892), Delphinula depressa Lea.

This entire genus and the species under it from San Pedro seems to have been ommited from Mrs. Oldroyd's work. We will therefore run the complete descriptions.

" Shell medium sized, moderately thick, spire low. Nucleus consisting of a few smooth whorls. Aperture flattened at base. Parietal callus thin. Outer lip as viewed from above , bent backward near periphery, distinctly channeled at junction with parietal callus. Inner lip thickened by a smooth area spirally arranged around umbilicus and resembling callus. Sculpture (of type species) consisting of punctate spiral grooves and obscure axial threads" (Woodring,1928, p. 443).

Solariorbis arnoldi Bartsch,1927. Proc. U.S.N.M. vol. 70:32,33, pl. 6, figs. 7,8,9. San Pedro, California.

" Shell large, lenticular, semitranslucent, bluish white. Nuclear whorls 1.2, well rounded, smooth. Postnuclear whorls moderately rounded, almost appressed at the summit, the first marked by six interrupted lines of pits and two slender spiral striations near the summit. As the whorls progress the pits become more or less fused into incised spiral lines, of which 7 occur upon the second and 24 upon the last whorl. In addition to the spiral sculpture, the whorls are marked by slender, somewhat irregular retractively slanting axial threads. Periphery of the last whorl slightly obtusely angulated. A rather broad band immediately below the periphery is devoid of spiral sculpture. Base broadly openly umbilicated; the posterior half marked by incised spiral lines which leave the elements between them as moderately broad, flattened cords and numerous lines of growth. The latter

(con.)

are a little rougher at the umbilical angle than on the flattened base. The umbilicus shows all the turns within it. Aperture decidedly oblique, oval; posterior angle with a slender sinus; outer lip thin, showing the external sculpture by transmitted light; inner lip heavy, thickened, curved; parietal wall covered with a rather thick callus that renders the peristome complete.

The type, Cat. No. 363784, U.S.N.M., was collected by Delos Arnold at San Pedro, California. It has three and one half whorls and measures, length 4 mm; height, 1.8 mm; greater diameter, 4.3 mm."

Family Scissurellidae

Genus Scissurella Orbigny,1824 Type (fide Winckworth,1932)., S. costata Orbigny.

" Shell minute, thin, not pearly; body whorl large; spire small; surface striated; aperture rounded, with a slit in the margin of the outer lip ; operculate. The young have no slit." (Tryon).

Scissurella kelseyi Dall,1905. Queen Charlotte Islands, B.C. to South Coronado Island. Type locality, off San Diego.

Scissurella chiricova Dall,1919. Southeast of Chirikoff Island, Alaska in 695 fathoms.

Genus Schismope Jeffreys,1856. Type (by monotypy), Schismope striatula (Philippi).

" Schismope is a Scissurella in which the anal slit becomes closed in the adult, and transformed into an oblong perforation like one of the holes of a Haliotis. It bears much the same relation to Scissurella that Trochotoma does to Pleurotomaria. The species inhabits deep water; there are a number of fossil forms described." (Tryon and Pilsbry,Man. Conch.)

In the discussion of the species of Schismope Dr. A. Myra Keen writes on one as follows (Per. Comm.) " " In the " Emendations to Bull. 112", 1923, Dall cites Schismope californica Bartsch as a substitute for S. coronata Watson,1886, as used in Bull. 112. However, as Watson 's shell referred to in Bull. 112 was from Tahiti and there is no word of diagnosis or description nor figure of the California Schismope, it seems to me that S. californica Bartsch in Dall,1923 must be regarded as a nomen nudum."

Schismope rimuloides (Carpenter),1864. South Coronado Island to Mazatlan, Mexico. Type locality: Mazatlan.

Genus Tornus Turton in Carrington,1830. Type (by monotypy), Helix subcarinata Montagu.

Dr. A. Myra Keen advises on this species as follows (Per. Comm.) " According to Dall in the " Emendations to Bull. 112", Schismope caliana should be allocated to Adeorbis S. Wood,1842. Adeorbis S. Wood,1842 seems to be a synonym of Tornus Turton in Carrington,1830. (Teigmouth, Dawlish and Torquay Guide, sign. G-2, fife Sherborn). Type (by monotypy), Helix subcarinata Montagu. Turton's original description, as quoted by Iredale,1915 (Proc. Mal. Soc. vol. 11, 1915, p. 173) is: " Shell orbicular, depressed; aperture oval or rounded, pillar none. Operculum horny"

Tornus calianus (Dall),1919. San Diego, California.

Family Fissurellidae
Shell with a marginal sinus at the end of the rib..........Hemitoma
Shell with a small perforation midway on the end ...... Rimula
Shell with an apical perforation or orifice
• Perforation bounded internally with a raised edge..Puncturella
• Perforation bounded by a smooth callus ridge
•• Perforation large, $\frac{1}{4}$ to 1/3 the length of the shell
(Animal larger than the shell)
••• Adult shell large, 75 to 100 mm. in length....... Megathura
••• Adult shell small, less than 25 mm. in length
•••• Sculptured with unequal, scaly radial ribs.... Lucapinella
•••• Radial ribs equal, nearly smooth ....Megatebennus
•• Perforation small, less than $\frac{1}{4}$ the length of the shell
(Animal contained in the shell)
••• Internal callus truncated posteriorly .... Diadora
••• Internal callus not truncated ....Fissurella

Genus Hemitoma
Radial ribs strong, imbricated by lines of growth
Length 50 mm. Forrester Island to Catalina ..... yatesii
Shell smaller, sculpture finer
Length 14 mm. Santa Cruz to San Pedro .... bella

Genus Rimula
Outer surface delicately cancellated
Length 3 mm. San Martin Island to Gulf of Calif. ...mazatlanica

Genus Puncturella
With wide spaced radial ribs and close concentric threads
• Intercalary radial riblets present
•• Major radial ribs about 20
Diam. 15 mm. Alaska to La Paz .... cucullata
•• Major radial ribs about 30
Diam. 27 mm. Alaska to San Diego ....multistriata
• Intercalary radial riblets absent
Chile to Patagonia .... falklandica
Tryon vol.12, p.231, pl.63, fig.23
With many nearly equal radial threads
• Shell high, conic
•• Internal laminae supported by a transverse rib
Diam. 10 mm. Alaska to San Pedro .... galeata
•• Internal laminae without props.
Diam. 7.5 mm. Alaska to San Pedro .... cooperi
• Shell subcylindrical, minute, radial threads strong
San Diego ....carophylla
• Shell low, expanded
Diam. 32 mm. Panama to Galapagos .... expansa
Bull. Mus. Comp. Zool. 43: 353, pl.4, figs 5-10-11

Genus Megathura
Radial and concentric ridges fine, close, equal
Length 100 mm. Monterey to Cerros Island .... crenulata

Genus Lucapinella
Radial ribs imbricated by strong lines of growth
Length 20 mm. Bodega Bay to Peru .... callomarginata

(con.)

Surface decussated by radial and concentric ridges
Central America .... aequalis
Tryon 12:197, pl.31, fig.24; Reeve, fig.55

Genus Megatebennus
Sculptured with rounded radial ribs
Length 20 mm. Forrester Island to Cape San Lucas ...bimaculatus
Sculptured with sharp radial grooves
Length 27.5 mm. Peru ....corkeri
Proc. U.S.N.M.37:243, pl.24, fig. 3-7.

Genus Diadora
Anterior and posterior slopes nearly straight
. Radial ribs unequal, concentric ridges forming scales
Length 45 mm. Alaska to Magdalena Bay .... aspera
. Radial ribs subequal, nodulous
Monterey to San Quentin Bay .... densiclathrata
Reeve pl. fig.64
Posterior slope humped behind the perforation
. Radiating ribs and concentric ridges equally strong
.. Perforation sub-central
Santa Barbara to Ecuador .... inaequalis
.. Perforation at about the 1.3 point
Length 10 mm. Gulf of Calif. to Panama ....saturnalis
Ann. Mag. Nat. Hist. 13:475
. Radiating ribs strong, concentric ridges delicate
Peru .... asperior
Reeve pl.5, fig.30; Tryon, 12:214, pl.30, fig.6
Anterior and posterior slopes nearly equally convex
. Surface between strong radial ribs finely cancellated
Length 10 mm. Gulf of Calif. to Peru .... panamensis
Reeve pl.12, fig.87; Tryon 12:216, pl.32, fig. 35
. Surface decussated by unequal radial and concentric ridges
Length 20 mm. Peru .... fontianiana
Tryon 12:207, pl.62; figs 28-29-30

Genus Fissurella
Margin of shell crenulated
. Inner margin dark bordered
.. Outer surface with radial and concentric sculpture
Chile........................philippiana
.. Outer surface with delicate radial sculpture only
Length 20 mm. Mazatlan ....nigricincta
. Inner margin not black bordered
.. Outer surface with major and minor radial ribs
... Major radial ribs few, prominent
.... Margin scalloped between 8 major ribs
Length 30 mm. Gulf of Calif. to Peru .... rugosa
.... Margin regularly ovate
Length 30 mm. Gulf of Calif. to Peru .... obscura
... Major radial threads small, numerous
Length 55 mm. Gulf of Calif. to Peru .... virescens
.. Outer surface with subequal radial riblets or striae
... Riblets subrugose, obscurely nodulous
Panama .... ostrina

(con.)

... Striae numerous, surface roughened with raised dots
Peru ....asperella

Margin of shell not crenulated, inside dark bordered
. Interior of shell deeply wrinkled
.. Outer surface with radial and concentric undulations
Length 85 mm. Panama to Peru .... crassa
. Interior of shell not deeply wrinkled
.. Outer surface with radial and concentric sculpture
... Shell conical, elevated
Length 82 mm. Ecuador to Chile.................... picta
... Shell more or less depressed
.... Radiating ribs nodose, with intermediate striae
Central America .... crenifera
.... Radiating ribs close, equal
Chile ....obovalis
.... Radiating grooves close-set, concentric striae fine
Length 40 mm. Panama to Magellan Straits .... mexicana
.... Sculpture fine, more or less obsolete
Chile .... fulvescens
.. Outer surface with radiating ribs or striae only
... Shell conical, elevated
.... Ribs rude, here and there larger
Crescent City to Panama .... volcano
.... Every 3rd to 7th riblet larger
Length 35 mm. Mazatlan to Peru .... peruviana
.... Fine radiating striae, coarser near the margin
Length 90 mm. Chile ....punctatissima
.... Striae fine, nearly obsolete
Length 100 mm. South America .... nigra
... Shell more or less depressed
.... Shell oval or circular
..... Ribs distant, prickly nodose
Ecuador ....clypeus
..... Ribs variable, uneven or nodulouse
8 mm. Gulf of Calif. ....alba
..... Riblets strong, rough, subequal
Length 74 mm. Panama to Chile .... costata
.... Shell ovate to elliptical
..... Ribs rather weak, uneven or tuberculate
Length 100 mm. Peru and Chile .... maxima
..... Fine radial striae over entire surface
Length 68 mm. Chile ....latimarginata
.. Outer surface without radial sculpture
... Surface with evident lines of growth, shell conical
Shell 77 mm. Chile .... limbata
... Surface with fine concentric striae, shell depressed
Length 54 mm. Chile .... pulchra
... Surface with a spongy texture, shell elongated
Length 17.5 mm. Gulf of Calif. .... spongosa

Genus Fissurella Bruguiere,1791

Fissurella volcano Reeve,1849 Crescent City to Panama
Fissurella obscura Sowerby,1834 Lower Calif. to Peru
Fissurella virescens Sowerby,1835 Gulf of Calif. to Peru
Fissurella rugosa Sowerby,1835 Gulf of Calif. to Panama

(con.)

Fissurella nigrocincta Carpenter,1855 Mazatlan
Fissurella alba Carpenter,1857 Mazatlan
Fissurella spongiosa Carpenter,1857 Mazatlan
Fissurella peruviana Lamarck,1822 Gulf of Calif. to Peru
Fissurella mexicana Sowerby, Mexico to Magellan Straits
Fissurella crassa Lamarck,1822 Panama to Peru
Fissurella nigra Lesson,1830 Peru to Magellan Straits
Fissurella philippiana Reeve,1849 Chile
Fissurella ostrina Reeve,1849 Panama
Fissurella crenifera Sowerby,1834 Central America
Fissurella latimarginata Sowerby,1834 Peru and Chile
Fissurella picta Gmelin,1791 Ecuador and Chile
Fissurella clypeus Sowerby,1834 Ecuador
Fissurella maxima Sowerby,1834 Peru and Chile
Fissurella asperella Sowerby,1835 Peru
Fissurella costata Lesson,1830 Peru and Chile
Fissurella fulvescens Sowerby,1834 Chile
Fissurella limbata Sowerby,1834 Chile
Fissurella obovalis Lesson,1830 Chile
Fissurella pulchra Sowerby,1834 Chile
Fissurella punctatissima Pilsbry,1890 Chile
Fissurella concinna Philippi Talara,Peru
Genus Megathura Pilsbry,1891
Megathura crenulata(Sowerby)1825
Genus Megatebennus Pilsbry,1890
Megatebennus bimaculatus Dall,1871 Forrester Island to Tres Marias Islands
Megatebennus corkeri Dall,1909 Peru
Genus Lucapinella Pilsbry,1890
Lucapinella callomarginata (Dall),1871 Bodega Bay to Peru
Lucapinella aequalis (Sowerby),1834 Central America to Ecuador
Genus Diadora Gray,1821
Diadora aspera Eschscholtz,1833 Cooks Inlet to Lower Calif.
Diadora densiclathrata Reeve,1850 Monterey to San Quentin Bay
Diadora murina Dall,1885 Crescent City to Magdalena Bay
Diadora alta (C.B. Adams),1852 Panama
Diadora panamensis Sowerby Gulf of Calif. to Peru
Diadora fontainiana (d'Orbigny),1841 Peru
Diadora asperior (Dall),1909 Peru
Genus Puncturella Lowe,1827
Puncturella cucullata Gould,1846 Alaska to La Paz
Puncturella galeata Gould,1846 Alaska to San Pedro
Puncturella cooperi Carpenter,1856 Alaska to San Pedro
Puncturella multistriata Dall,1914 Alaska to Cortez Bank
Puncturella carophylla Dall,1914 San Diego
Puncturella (Cranopsis) expansa Dall,1896 Galapagos
Puncturella (Cemoria) falklandica (A. Adams),1862 Chile to Patagonia
Genus Rimula
Rimula mazatlanica Carpenter,1857 San Martin Island to Mazatlan
Genus Hemitoma Swainson,1840
Hemitoma yatesii Dall,1901 Forrester Island to Panama ?
Hemitoma bella Gabb, 1865 Santa Cruz to San Pedro
Hemitoma golischae Dall,1916 San Nicholas Island
Hemitoma hermosa Mawe Gulf of Calif.

* Note* Discussion of Haliotidae and Fissurellidae will appear in our next issue.

Note to the members from the editor- My business is going to compell me to be away in the northern part of the state a good part of this spring, so if the delivery of the Minutes is a bit irregular you will know why.

A word to our many exchange correspondents should be in order also. Aside from the daily struggle to earn a living I seem to be devoting all of my spare time to getting out these Minutes and have had little or no time for either collecting or working with my duplicates. However, I am still very much interested in building up my collection as well as my library. All contributions sent me will be gratefully received and at present about the only return I am able to make is in my efforts with these papers. Many of my correspondents have been remembering me with boxes of shells and I wish to thank them.

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Mr. H.J. Koch, P.O. Dynamite Factory, Somerset West, South Africa.

" I must thank you for your prompt attention and for a copy of the Minutes. I found them most instructive and would be glad of back issues. I would like to contribute to your club if you are agreeable.

I am afraid that I did rather get the impression that yours was a business and not a scientific club as it really is. I am willing to help within the limits of the time at my disposal and will do my best to arrange exchanges with some of your members, two of whom have already written.

I look forward to receiving the books. We are very badly off for literature in this country and any suggestions you may be able to make with regard to good books to get I should be grateful for.

I will close with thanks and express my pleasure at having made contact with your organization. My wife who is also working on molluscs (we both do it as a hobby) joins with me in expressing these sentiments."

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